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THE
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OF
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CONDUCTED

BY W. NEWTON,

CIVIL ENGINEER AND MECHANICAL DRAFTSMAN.

(Assisted by several Scientific Gentlemen.)

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I. Roberts' Block Printing Apparatus; Bakewell's Soda Water Apparatus; De Bergue's Spinning Machinery; and Hodge's Improvements in Dyeing Hats.

II. Bacon's Locomotive Engine; Brown's Paper Machinery; Booth's Connecting Chains, and Improved Iron Roofs.

III. Greig's Embossing Machinery; and Williams' Felting Machinery.

IV. Ramsbottom's Spinning Machinery; Potter's Spinning Machinery; Pearse's Improved Wheel; and Ward's Ventilator.

V. Wilde and Whitworth's Knitting Machinery.

VI. Palmer's Locomotive Engine; and Lidel's Improved Piano-fortes.

VII. Springall and Ransome's Plough-share; Ashdowne's Improved Cart Wheel; and Kneller's Distilling Apparatus.

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No. LXI.

Recent Patents.

To JOHN ROBERTS, *of Prestolle, in the parish of Prestwick, and county of Lancaster, calico printer, for his invention of certain improvements in the art of block printing.*—[Sealed 27th June, 1836.]

THESE improvements in the art of block printing consist in a peculiar and novel construction of apparatus to be used in that particular branch of the art known in the trade by the term "springing," and which is more particularly applicable in those situations where one colour only is to be taken up by the block. The present improvement is the new arrangement of the parts connected with and constituting the sieve cloth and its elastic bed; this cloth or sieve (which may be used either with or without its bed) being the ordinary surface upon which the colour is spread, in order to be transferred to the face of the block that gives the form of the pattern or device intended to be printed. Firstly, the framing, which confines the edges of the sieve cloth, is so constructed, that it may be easily adjusted to any degree of tension in order to suit the quality of the various colours to be employed for printing; and also, to accommodate itself to the various consistencies of the colours, from which a convenience will also result, namely, that the tension of the sieve cloth may be adapted to suit the style of pattern intended to be printed; that is, that a greater or less portion of colour may be presented to the surface of the block, according to the character of the pattern; and, secondly, the whole apparatus is so constructed, that the necessity of children attending upon every printer for the purpose of spreading the colour after every dip of the block, is obviated by the colour in this improved "springing tub" always flowing in sufficient quantity, and regulating its own supply, ready for each presentation of the block to the sieve cloth.

In order that my invention may be more perfectly understood, I have attached hereto a drawing, representing different views of my improved "springing tub," the same letters of reference pointing out corresponding parts in all the figures.

Fig. 1, Plate I., is a plan or horizontal view of the springing tub, as seen from above, part of the sieve cloth being removed, in order to show the interior of the apparatus. Fig. 2, is an elevation seen partly in section as cut through fig. 1, in the dotted line A, B; and fig. 3, is an end elevation taken at the right hand of fig. 1: *a*, *a*, is a reservoir or case made of tin or other suitable material, to contain the colour intended to be used for printing, which colour flows through the pipe *b*, *b*, and tap *c*, to the channels *d*, *d*, *d*, in the wooden box below; which several channels are all connected with each other. These channels or passages *d*, *d*, are formed in a solid piece of wood;

and are for the purpose of supplying a portion of the colour to the under surface of the sieve cloth *e, e*, through the bed *f, f*. This bed operates as a support for the sieve cloth, and is perforated with small holes, in order that the colour may flow freely through it to the under part of the sieve cloth. The number and size of the holes must be determined by the operator, as upon them the supply of colour will greatly depend, and which must be varied to suit the different styles of pattern to be printed. It will be seen that three sides or edges of the sieve cloth are confined by the framing or wood-work *g, g, g*; and the fourth side or edge is attached to the rail *h*, which has a strengthening bar of iron fixed to it for the purpose of carrying the nut of the screw *i, i*: this rail *h*, has two small projecting ends, which run in slots or grooves formed in each side of the iron framing *j, j*; and by turning the small screw *i*, the rail will be adjusted in the framing *j*, and with it the required tension of the sieve cloth will be obtained and regulated, the exact or most suitable tightness of which, can only be determined by the experience of the practical printer. It will be understood that the sieve cloth *e*, in the horizontal view, fig. 1, represented as broken, must be entire, and its outer end securely fastened to the moveable rail *h, h*. A portion only of the diaphragm or perforated bed *f*, is likewise shown; but it will be understood that this is fastened to the framing of the apparatus all round, and extends under the whole of the operating surface of the sieve cloth.

In order that the supply of colour to the sieve cloth may be admitted evenly after every dip of the printing block, I prefer that the bed *f, f*, should be made of common oil-cloth casing, or other such waterproof material, so that the colour shall only pass through the perforations or holes;

and it is also necessary to state, that the sieve cloth itself may be varied to suit the different patterns to be printed, as I have found it very advantageous, in many cases, to use two or more thicknesses of the cloth in immediate connexion with each other; and I have also found a great convenience in varying the quality of the materials of which the fabric is composed, such as cotton and wool, linen and cotton, or otherwise. It will be perceived that the supply of colour to the apparatus is afforded and regulated by opening the cock *c*, in the pipe *b*, either partially or to its full extent, and also by varying the height of the reservoir of colour, which will vary its pressure. This latter regulation maybe done at the pleasure of the operator, by turning the adjusting screw K, K, which is set at the back of the framing for supporting the reservoir.

It only remains to add, that the reservoir is to be charged with colour through the small funnel *l*, on the top, (which must be closed by a plug while the apparatus is in use,) and any waste colour is to be discharged by the opening *m*, behind, communicating with the channels *d*, *d*. This, of course, is also to be stopped while the apparatus is in use.

In conclusion, I wish it to be understood that I do not confine myself to the dimensions or materials of any of the parts of the improved springing tub described above; but I claim as my invention, the construction of apparatus shown in the drawings, and its employment for the purposes above described.—[*Inrolled in the Rolls Chapel Office, December,* 1836.]

Specification drawn by Messrs. Newton and Berry.

To WILLIAM WAINWRIGHT POTTS *and* WILLIAM MACHIN, *both of Burslem, in the county of Stafford, china and earthenware manufacturers, and* WILLIAM BOURNE, *of the same place, manager, for their invention of an improved method or process whereby impressions or patterns in one or more colours or metallic preparations are produced, and transferred to surfaces of metal, wood, cloth, paper, papier machée, bone, slate, marble, and other suitable substances, prepared or otherwise; not being used or known as earthenware, porcelain, china, glass, or other similar substances.*—[Sealed 2nd July, 1836.]

THE subject of this patent appears to be the adaptation of a process nearly similar to that employed for printing china or other earthenware to the purposes of painting and ornamenting tea-trays, work-boxes, dressing-cases, and a variety of other fancy articles of paper, wood, and other substances, as japan and Tunbridge wares.

The Patentees, in order to render their intentions obvious, have described the ordinary mode of taking impressions from engraved copper plates upon thin paper, and transferring those impressions to the surfaces of japan goods or Tunbridge wares, or other varnished surfaces. They have then described their improved mode, which seems to be in its general features nearly the same as the old method, having only some slight points of variance in the manipulations, which, if intended to constitute the subject of the patent right, should have been more clearly defined. We, however, give the description of the improved process nearly in the words of the Patentees, in order that the invention may not be misunderstood by any erroneous views which we might take of it.

A design or pattern being engraved on a copper or other suitable metal plate, in the ordinary manner, the plate is placed on a stove, having a flat top or slab, so as to form a table of sufficient size for the reception of the plate. The stove being fixed, the plate is retained on the flat top until it is sufficiently heated to render the colouring matter to be applied to it sufficiently liquid for working. The colouring matter is mixed with transferring oil, similar to that used by manufacturers of china and earthenware in preparing colours for ornamenting those substances, and when mixed, is rubbed over the plate until the engraved pattern or design is sufficiently filled. The plate is then scraped, and cleared of the superfluous colouring matter in the usual manner.

A sheet of paper, adapted in dimensions to the engraving, and previously sized with a ley of soft soap or other suitable sizing matter, is then placed, whilst yet moist from the sizing, evenly over the plate, and the whole passed between the rollers of an ordinary engraver's press in the usual way. For this purpose the Patentees generally use tissue paper; but where the pattern is large, or contains a great body of colour, a stronger paper may be desirable.

The paper, bearing the impression in one colour only, when drawn off the plate, is ready to be transferred. The sheet must then be placed, with its printed face downwards, on the surface of the article intended to be ornamented, and must be brought into even and uniform contact by gently rubbing the back of the paper with the hand, or with a soft rubber, and is to be so left until the colour has been imbibed, or become sufficiently attached to the surface to which it is applied.

The paper being then soaked with a wet sponge, may be rubbed off without difficulty, leaving the coloured design completely transferred to the surface of the article, the previous operation of sizing which the paper has undergone, disposing its fibres to part freely from the colouring matter, and to separate easily from the surface.

Where several colours are intended to be used in the same design or pattern, such parts only of the design or pattern as are intended to be in one of those colours is engraved on the plate; and it is most advisable that the finer parts of the design, such as the outlines, should be obtained from the engraved plate, leaving the body of the colouring to be filled in afterwards.

The sheet of paper, with the outlines of the design taken from the engraved plate, is to be laid upon a smooth block or slab of stone covered with a fine blanket, in order that the remainder of the pattern or filling may be supplied in the other colours. This is to be done by means of blocks, similar to those used by calico printers. The blocks are so formed and arranged, as exactly to correspond with the parts of the pattern previously obtained from the engraving, in order that they may form, when combined, a complete design.

It is evident that by this method, patterns in any required number of colours may be produced, each portion of the pattern being impressed from a separate block in a distinct colour, so that the impressions, when combined, may unite and form the complete design. When, however, the engraved parts of the pattern, consisting of outlines and shading, have been first given to the paper either in black, or in dark tints of any colour, the body colours may be applied by the blocks upon such shading or outline; for when the pattern is transferred from the paper to the surface intended to be ornamented, the outlines and shading being next the surface of the paper, will ultimately be found to lie on the exterior of the article so ornamented.

Besides blocks, metal types or similar implements for giving a coloured impression from a raised surface, may be used for filling up the pattern; and many designs or patterns may be conveniently obtained from blocks or other raised surfaces alone, without having recourse to engraved plates; and as, in this case, the sized paper will not undergo the drying effect of the heated plate, it should, after sizing, be allowed to become nearly dry before being printed on by the blocks. It is, however, considered that the most ornamental and effective patterns may be obtained by the combination of impressions from an engraved plate and of blocks, in the manner described.

The first impression on the sized paper may be obtained by the process of lithography, instead of an engraved plate; and, in this case, the sized paper should also be used in a dryer state than when applied to a heated copper plate. For the purpose of applying the colouring matter to the surfaces of the blocks, composition rollers are to be used by the hand, the colouring matter being applied in a cold state.

With regard to the colours which may be used, the selection of these forms no part of the invention, but they must, in all cases, be such as are employed for the like purposes in ornamenting the respective substances to which the invention applies. The colour must, however, be mixed or prepared with a compound or transferring oil, hereinafter described.

When metalline powders are used as gold or silver, the metal having been first reduced to a pulverized form by the common process of solution and precipitation, is to be mixed with the transferring oil, and employed in the printing of the required pattern in the form of printing ink; and after being transferred to the surface of the article to be ornamented, must, when perfectly dry, be burnished until bright, and then varnished in the ordinary manner.

In the foregoing description, the methods of performing by a flat engraved plate, and by blocks applied by hand, has been described; but the same may be more advantageously effected, that is, to a larger extent, and with less expenditure of labour, by the employment of machines, similar in construction to those used by calico printers. These are, first, a cylinder machine, whereby a pattern, or part of a pattern, is obtained from an engraved copper roller continually revolving, and which, as it revolves, is constantly supplied with colouring matter from a trough, and is cleared of its superfluous colour by a scraper. Secondly, a flat press, wherein a pattern, or part of a pattern, is obtained from a flat plate, the colouring matter being furnished by flexible inking rollers or dabbers, and the superfluous colouring cleared away by a scraper; and thirdly, a surface printing machine, in which a pattern, or a part or several successive parts of a pattern, are obtained from rollers, called surface rollers, in which the portions intended to give the impression are raised as in the blocks worked by hand, and which are inked by flexible colouring rollers. It is, however, unnecessary to describe these machines, as they form no part of the invention; the cylinder machine and flat press, with their adaptations, having been fully described in the specification of a patent dated the 17th of September, 1831, granted to John Potts, Richard Oliver, and William Wainwright Potts, (see vol. i. of our Conjoined Series, page 126,) the surface printing machine with its adaptations, and the manner of using the same, being fully described in the specification of another patent granted 3d December, 1835, to William Wainwright Potts (see vol. ix. of our Conjoined Series, page 158). Patterns may also be obtained by the employment of any of the presses in common use among letter-press printers.

The surfaces intended to be ornamented may either require to be prepared or not: for instance, if wood be the substance to be ornamented, the surface may either be made clean, or it may be covered with a varnish; if iron, or other metal, the surface may be clean, or japanned, or varnished, and so in respect to other substances to which the improved process is intended to apply, the ordinary modes of preparation being employed where found expedient, according to the discretion of the operator.

The soap ley or material to be used for sizing the tissue paper, and also the transferring oil for mixing the colour, are of the kinds in common use among manufacturers of earthenware, and are to be obtained in the potteries ready for use; but it may be desirable to state the methods of preparing these articles, although they form no part of the invention.

The ley or size is prepared by boiling soft soap in water, with a little of the common soda of commerce, in the proportions of about one pound of soap and an ounce of soda to a gallon of water. These must be boiled until the soap and soda are well dissolved in the water. The size may be applied to the paper by a brush or sponge, or by the paper being passed between rollers covered with blankets, the lower one revolving in a trough filled with the size.

The transferring oil is prepared by boiling together linseed oil and rape oil, in the proportions of one quart of linseed oil to half a pint of rape oil, adding to them whilst boiling one ounce of white lead, the like quantity of common white or brown resin, and the like quantity of common tar. These ingredients are to be boiled over a clear red fire. When the boiling has continued about half an hour, the liquid must be fired with a lighted paper and allowed to burn, extinguishing the flame when the boiling becomes too violent, and repeating the firing until the liquid becomes ropy. Its being sufficiently reduced or inspissated, may be ascertained by dropping a little on a plate, and trying its tenacity by the finger; if it ropes, or extends five or six inches from the finger when lifted up, it may be considered as sufficiently boiled. It should then be removed from the fire, and allowed to cool until the boiling has ceased, when about a quarter of a pint of spirits of volatile oil of tar should be mixed with it. The older the oils employed the better, as less boiling and firing are then necessary for the reduction of the mixed oils.

This improved process of printing in colours may be applied to a great variety of ornamental purposes, such as the ornamenting of boxes, trays, and other similar articles; the production of ornamental papers for hanging rooms, or the decoration of the walls of rooms, by transferring patterns or designs thereto, or the production of pictures by transferring patterns or designs to prepared canvas, all which are mentioned merely as examples illustrative of the applicability of the invention to ornamental purposes.

In conclusion, the Patentees declare that their invention consists in a novel application of a well-known process of art to purposes for which such process has not heretofore been employed, namely, the transferring of impressions from engraved surfaces, or printing, or lithographing, or blocks, to the surfaces of metal, wood, and other articles herein specified, by similar manipulations, preparations, and materials to those which are and have been in use in effecting such transfers of designs to the surfaces of earthenware, porcelain, china, and other similar substances; they therefore claim the sole and exclusive right to effect, by the several means herein described, the transfer of ornamental designs, patterns, or pictures from engraved surfaces, or printing or lithographing books to the surfaces, clean or varnished, or prepared, as hereinbefore mentioned, of metal, wood, cloth, paper, papier machée, bone, slate, marble, and other suitable substances, not being used or known as earthenware, porcelain, china, glass, or other similar substances; and they consider the essential and indispensable parts of such process to be the taking off or printing the impression for the transfer upon paper, sized or impregnated with such a size or ley as hereinbefore mentioned, the colouring matter being mixed or incorporated with the prepared oils as a vehicle, as described to be practised in the process of ornamenting earthenware by transferred designs; and further, the prompt application of such impressions before the vehicle has become dry to the surfaces to be ornamented. Such process, with the various details herein set forth, as it is to be applied to the ornamenting of the substances enumerated above, they claim, by the aid of whatever implements, tools, or machines the same process may be effected. And they declare that they do not claim as of their invention any of the implements or machines herein described or adverted to as subservient to the art; but they claim the method of effecting this their process of transfer by the employment and use of such implements or machines, or of any such other implements or machines as may appear needful or convenient to be adopted for effecting their said process of transfer.—[*Inrolled in the Inrolment Office, January,* 1837.]

To RICHARD FELL, *of Fountain-yard, Vauxhall Bridge-road, in the county of Middlesex, plumber, for his improvements in machinery or apparatus for raising water, and in the application thereof to certain useful purposes.* —[Sealed 24th May, 1831.]

THIS is one of those extraordinary wild schemes for obtaining power which occasionally are brought under our notice. A very imperfect outline drawing accompanying the specification is intended, we presume, to represent the apparatus in section, which consists of an extremely complicated arrangement of cylindrical air and water pumps, with a multitude of pipes connecting them together, and conducting the fluids from one vessel to another, and ultimately into a large vessel occupied with water at the lower part and with air at the upper. This is also connected with two conical vessels, in each of which an expanding piston is placed, and so contrived by springs and sliding pieces, as to fill the transverse section of the vessel either at its larger or smaller diameter; and a multitude of valves are introduced into different parts of the apparatus for allowing the fluids to pass through, but preventing their return. Piston rods extending from the several pumps are each connected to a crank upon a long shaft, so that they are all to move simultaneously; but whether this crank shaft is to be the driver of the several pumps, or to be the recipient of the moving power derived from the action of the pumps and their piston rods, does not appear. It is however expected by the Patentee, that in some parts of the apparatus, we presume in the large vessel, there will be a surplus of power accumulated; that is, that there will be a surplus quantity of water raised, or the air in the vessel brought into a condensed state, the elastic force derived from which is to be the power "applicable to certain useful purposes."

We do not consider it necessary to exhibit the figure of this complicated and absurd scheme, as its fallacy must be obvious to every man of science.—[*Inrolled in the Inrolment Office, November,* 1831.]

To Thomas Augustus Gregory Gillyon, *of Crown-street, Finsbury-square, in the county of Middlesex, engineer, for his invention of improvements on ordnance, and on the carriages and projectiles to be used therewith.* —[Sealed 19th October, 1833.]

The principal improvement proposed under this patent, is the construction of what may be properly called a double cannon, that is, two distinct pieces of ordnance connected together at the breech in such a manner in parallel position, that they may both be discharged at the same instant by means of a common touch-hole, which communicates with the loading of each piece by means of diagonal passages. The next improvement relates to the projectiles to be employed with these guns, and consists of a small addition to the chain-shot now in use. In the ordinary chain-shot, the balls are liable to be rent away from the chain immediately on their leaving the gun, by a sort of twisting motion given it by the force of the gunpowder: this the Patentee proposes to remedy by attaching the shots to the chain by means of swivels, which will allow them to turn round after their exit from the gun, instead of the shots being directly attached to the links of the chain, as heretofore.

The Patentee states, that the advantages to be derived from using these double-barrelled cannon will be, that when the guns are to be loaded, one of the shots being put into each piece, and the connecting chain allowed to hang down between them, the effect will be that the shots will be caused to spread, and therefore perform a greater range of execution in the field, or cut up the rigging with greater effect in a naval engagement.—[*Inrolled in the Inrolment Office, April,* 1834.]

To JOHN BUCHANAN, *of Ramsbottom, in the county of Lancaster, millwright, for his invention of certain improvements in the construction of cylinder printing-machines, used for printing paper, calico, and other fabrics.*—[Sealed 13th May, 1835.]

THE main feature of this invention, is dispensing with the endless blanket usually employed for conducting and backing the calico, or other fabric, when it passes between the cylinders of the printing machine.

It does not app ar that the Patentee contemplates a single alteration in the construction or arrangement of the working parts of a machine for printing by cylindrical surfaces, he merely omits the endless blanket and the machinery for carrying it; but in some cases he employs in its stead a piece of gray cotton, which is passed between the printing bowl and the goods, and is wound off one roller on to another. There is also a provision by which this gray cotton may be dried, if necessary, by passing through a steam box.

The goods or length of fabric, whether of cotton or other material, to be printed, is to be either drawn off a roll, or taken up from a folded heap upon a table, and passed between tension rails in the usual way, for the purpose of rendering it straight and even when brought in contact with the printing cylinder. The bowl, or resisting cylinder, which causes the device of the engraved cylinder to be imprinted upon the face of the fabric, is to be covered with very fine blanketing, or some other suitable elastic material, as the finer the coating of the bowl, the more clear and perfect will be the impression.

The covering of the bowl is to be limited to the width of the fabric to be printed, in order to prevent the printing ink or colour being deposited upon it, which precaution will effect a great saving of material; and tapes are to be placed very accurately for guarding the selvages.

The fabric, when so printed, is conducted upward through the floor of the upper apartment, where it is passed round a large drum, heated by steam, for the purpose of drying the print, and it is then deposited in folds upon the floor.

The piece of gray cotton for backing the goods is only to be used when the pattern printed contains a very considerable quantity of colour; it will, in that case, assist in drying up part of the moisture by absorption, and is more particularly required when the fabric is nearly covered with colour, as in the operation called padding the ground.

It would be perfectly useless for us to show any figures of the machine, as the Patentee says, "I do not claim any of the ordinary or well-known parts of the machine separately or individually, all of which may be varied both in construction and material, according to the nature of the work to be produced, and all of which modifications or variations are well known to mechanics; but I do claim the adaptation or application of a revolving drying cylinder to a cylinder printing machine; the more accurate arrangement of the lapping on the bowl, and the government of the tapes, by which I am enabled to dispense with the ordinary blanket or endless cloth.

"I am aware that the various apparatus which I do claim as my invention, as applied to cylinder printing machines, may be varied and modified; yet, I claim all such modifications or variations by which the ordinary blanket used in cylinder printing and padding machinery, shall or may be dispensed with: for although a similar effect may be produced, nevertheless, the dispensing with the blanket or endless woollen cloth being of itself a discovery and invention, at which I have arrived by long experience and labour, and which never has before been effected in this kingdom, that is my claim."—[*Inrolled in the Inrolment Office, November*, 1835.]

[It is very certain that the arrangement of parts above proposed in all their modifications and variations, if new, might be claimed and maintained as applied to the object; but it is by no means so certain that the negative claims of *dispensing with the endless blanket* can constitute a valid patent right.—ED.]

To WILLIAM GUTTERIDGE, *of the parish of St. John, Clerkenwell, in the county of Middlesex, civil engineer, for his having invented certain improvements in apparatus for distilling and other purposes.*—[Sealed 18th May, 1831.]

THE subject of this patent is an apparatus to be connected to a still, for the purpose of refrigerating and condensing the spirit as it rises from the process of distillation. The improvement consists in constructing a series of chambers, compartments, tubes, or pipes, in what the Patentee denominates a superior form, with contiguous water vessels, through which the alcoholic vapour is made to pass, for the purpose of cooling and partially condensing it; the heavier portions of the vapour being allowed to run down through small apertures again into the still, for further rectification.

The apparatus is shown in the drawing accompanying the specification, in several forms; it may be placed above the still, if the still is heated by fire; or it may form a part of the still-head, if the heat of steam is employed to produce the distillation; or it may be connected to the still-head in various other modified forms or ways, the object being to produce partial condensation before the vapour reaches the ultimate condenser, which is formed, with many small tubes, for the passage of the vapour, and surrounded by copious water chambers in the bottom of the receiving vessel.

The specification, though of very considerable length, appears rather mistified; and does not, in our opinion, point out any particular feature of novelty. The Patentee says, at the conclusion, in the old hacknied phraseology, that he does not claim what has been known before, but that he does claim what we do not comprehend, viz. the method of forming the vessels as syphons, and the arrangement of the partial and final condenser, as described.—[*Inrolled in the Inrolment Office, November,* 1831.]

To JOSEPH FERGUSON, *of Carlisle, manufacturer, for his invention of a certain combination of processes whereby a new kind of dress or finish is given to certain goods.*—[Sealed 23d December, 1834.]

THE general reader is left very considerably in the dark with regard to this invention, as the Patentee simply calls it a new dress or finish to be given to certain cotton cloths, plain, twilled, or figured, without pointing out either the effect produced or the object to be attained.

The process is described as commencing after the cloth has been *beetled in a beetling* machine for the space of fifty or sixty hours, and brought to a very high gloss; it is then put into a damping machine, where it is to be thoroughly saturated with water; after which, the cloth is passed through a drying apparatus, constructed with copper cylinders heated by steam. None of these machines are described, as they are considered to be well known.

If the goods are of the twilled kind, they are to be stretched out as tight as they will bear while passing through the drying apparatus, for the purpose of bringing out the twill; if plain woven goods, an ordinary tension will suffice.

If the goods are coloured, the drying should be done with care, and, perhaps, at two or three operations; but if in the white, or, as they term it, in the gray, they may be dried at once, the speed of the revolving cylinders being such as will cause the fabric to become effectually dried in passing through the machine. The stiffening should be properly attended to, and be made very firm.

The claim which closes the specification, is the process of damping and drying, as described in combination with the improved beetling process, to produce a new kind of dress.—[*Inrolled in the Inrolment Office, June,* 1835.]

To EDWARD JOHN DENT, *of the Strand, in the county of Middlesex, chronometer-maker, for his invention of an improvement of the balance springs, and their adjustments, of chronometers and other time-keepers.*—[Sealed 23rd April, 1836.]

THE Patentee describes the objects of his invention in the following words:—" It is well known that the delicate spiral balance springs of chronometers and other time-keepers, and their adjustments, are exceedingly liable to injury from oxidation or rust, both during the progress of their manufacture and when in use; and whereby they are not only subject to decay, but their rates of going and accuracy of performance is very considerably varied from time to time. Now this said oxidation or rust may either be caused by the moisture ordinarily contained in the atmosphere, especially by the sea air in voyages, or in countries particularly exposed to its action. Nor are chronometers only liable to suffer from these causes, but also from the perspired matter and the breath of the workman during the progress of their manufacture. Now it is the chief object of my invention, to prevent, as far as possible, the said oxidation or rust, by coating or defending those delicate parts of chronometers with a coating or varnish sufficiently flexible to allow the perfect free action of the balance springs, and yet capable of preventing the action of moisture or saline and other vapours to which they are liable to be exposed.

"And I hereby claim as my invention, and the object of this patent, the use and application of any fit and proper flexible defensive coating or varnish, to the more effectual prevention of oxidation or rust in the balance springs and adjustments of chronometers and other time-keepers.

"In order, however, to afford an example of the best means I am acquainted with for carrying my said invention into effect, I will describe the composition of such a varnish or coating as I have found to answer the purpose completely. I take half an ounce, by measure, of pure spirit of turpentine, and put to it forty grains of camphor, and also add ten grains of bruised gum copal to the said mixture. I then heat it nearly to its boiling point, and keep it in that state for two hours. I then filter the mixture through cotton or other proper substance. This varnish should be kept in an air-tight bottle closed by a glass stopper, the mouth of it being sufficiently large to admit the balance spring and its adjustment, which are to be put into the bottle in a dry state, and free from oil or grease; and after being completely immersed in the varnish, are to be carefully drained before they are removed from the bottle. The balance spring and its adjustment must then be placed into a temperature of from two hundred to three hundred degrees of Fahrenheit's thermometer, and to be kept therein from six to eight hours.

"I would remark, that in place of using pure spirit of turpentine and camphor, I prefer to use half an ounce of an oil formed in portable gas reservoirs, when that oil can be obtained; but as portable gas is now but little employed, and is going out of use, the materials I have above described will be found to answer well, and may be readily obtained from chemists, care being observed in obtaining pure spirits of turpentine.

"Having thus described my invention, and the best means I am acquainted with for carrying the same into effect, I would wish it to be understood, I do not claim a right to any mixture or processes for varnish-making, but only to the application of any fit and proper and sufficiently flexible coating or varnish to the balance springs and adjustments of chronometers and other time-keepers; and thus effectually protect the said balance springs whilst under the different exposures of temperature during their manufacture, when moisture is likely to be deposited thereon, and also to resist atmospheric attacks, as well as the many damps and impregnated vapours to which the chronometers and other time-keepers are frequently subjected on ship board, and particularly in tropical climates."—[*Inrolled in the Inrolment Office, October,* 1836.]

To FREDERICK COLLIER BAKEWELL, *of Hampstead, in the county of Middlesex, gentleman, for his having invented certain improvements in machinery or apparatus for making or manufacturing soda-water and other aerated waters or liquids.*—[Sealed 8th March, 1832.]

THIS is a mode of impregnating water with carbonic acid gas, by means of an apparatus represented in Plate I.

A strong iron case *a, a,* shown in section at fig. 4, is supposed to be capable of sustaining the pressure of at least eight atmospheres; *b*, is a partition dividing the apparatus into two parts, an upper and a lower chamber, the partition being placed about one-third of the way from the bottom. An aperture *c*, closed by an air-tight screw cap, is for the purpose of admitting the water about to be impregnated with carbonic acid gas into the upper chamber *d*; and the stop-cock *e*, is for the purpose of emptying this chamber of the water after it has become sufficiently impregnated with the gas. In the lower chamber *f*, the carbonic acid gas is made in the manner hereafter described.

The aperture *g*, is for the purpose of admitting the materials which are to give out the gas into the lower chamber. A box or reservoir *h*, contains diluted sulphuric acid, of which it is capable of holding about one pint and a half, occupies a space in the middle of the lower chamber; *i*, is the aperture by which the acid is conveyed into the reservoir *h*. A tube *j*, is passed through the partition *b*, being of about one inch and a half diameter; the lower end of this tube is opened for the purpose of allowing the gas, generated in the lower chamber *f*, to ascend up it: at the top of this tube, which is securely closed in any convenient manner, a small pipe *k*, is attached, the diameter of which is three-eighths of an inch: the lower end of this pipe *k*, is connected to another tube *l*, which the Patentee denominates the gas-washer. Near the bottom, in the interior of this tube or gas-washer, is a partition *m*, which is perforated with a number of minute holes; and at the top of this tube are two shelves slanting downwards, and extending each about two-thirds of the way across the tube: what is the use of these shelves, the Patentee does not inform us.

At the upper part of the tube *l*, near the shelves, is another small pipe *n*, bent downwards, and brought nearly in contact with the partition *b*. At the lower end of this tube *n*, a sort of rose-head, perforated with minute holes, is attached: this is for the purpose of disseminating the gas through the water when it is generated.

The Patentee next describes the manner in which he makes the carbonic acid gas. The water which it is desired to impregnate is first poured into the upper chamber *d*, through the aperture *c*; then the apparatus is brought into a horizontal position, and a quantity of chalk, whiting, or other calcareous earth in a pounded state, is conveyed into the lower chamber *f*, through the aperture *g*, after which, the box or reservoir *h*, is filled through the aperture *i*, with diluted sulphuric acid.

The apparatus is then in a proper state to be put into operation, which is done by swinging it upon the pivots *o*, *o*, backwards and forwards. This motion will agitate the sulphuric acid in the reservoir *h*, and at every vibration a small quantity will be splashed out at the aperture *p*, in the neck of the reservoir; and the acid falling upon a shield or guard *q* will be distributed over the surface of the whiting, chalk, or other calcareous matter which is contained in the lower chamber.

A pendulum *r*, is suspended from the partition *b*; its use is to stir up the whiting, chalk, &c., that a fresh surface may always be presented to be acted upon by the acid.

As the gas generates, from the chemical action of the materials in the chamber *f*, its elastic pressure causes it to force its way up the pipe *j*, down the pipe *k*, through the partition *m*, in the gas-washer *l*, and down the small pipe *n*; from whence it issues through the rose-head into the upper chamber *d*; and as the water in this chamber has been kept in a constant state of agitation by the motion of the apparatus, it is in a fit and divided state to absorb the gas as it passes in.

A shelf *s*, is attached to the outer casing slanting downwards, and extending about one-third of the way across the interior of the chamber *d*; the use of this shelf is to break the water as the apparatus vibrates or revolves upon the pivots *o*, *o*, for the purpose of causing it to absorb the gas more quickly.

The Patentee observes, that the lower chamber, and all such other parts of the apparatus as come in contact with the acid, should be lined with lead, earthenware, or any other material that is not prejudicially acted upon by the acid; and that if with earthenware, care should be taken that the gas has an opportunity of communicating its elastic force to the outer iron casing, because if it did not, the earthenware would perhaps be burst by the expansive force of the gas. It should also be observed, that the inner surface of the casing should be painted or japanned, to protect it from the effects of oxidation.

The Patentee states in conclusion, that he claims as his invention the particular arrangement of apparatus hereinbefore described, that is to say, the arrangement of combining the soda-water chamber and the chamber for generating the gas within an outer casing, so as to equalize the pressure, and cause the gas from its own elastic force to be absorbed by the water. This arrangement being much less expensive, than if two strong and separate chambers were used for generating the gas and making the soda water; and also the arrangement of placing the reservoir of acid within the gas generator, and the whole within an outer casing, so that the action caused by giving the whole apparatus motion, may at the same time agitate the water, the sulphuric acid, and the whiting, chalk, or other calcareous earth used for generating the gas. He also claims that part of the apparatus called the gas-washer, and the combination of small tubes and large ones, as constituting the gas-washer; as this arrangement prevents any of the whiting or other calcareous earth that emits the gas from getting into the soda water in the upper chamber upon any sudden ebullition of the gas.—[*Inrolled in the Inrolment Office, September,* 1832.]

To Charles de Bergue, *of Clapham, in the county of Surrey, engineer, for his invention of certain improvements in machinery for spinning or twisting cotton, flax, silk, and other fibrous substances.*—[Sealed 15th November, 1834.]

This invention, if such it can be called, is confined within very narrow limits; it consists simply in driving the spindles, or it may be the flyers or the bobbins of a throstle frame, by endless friction bands distended tightly over tension pulleys, which, by rubbing against the warves or whirls in passing longitudinally, communicate to the spindles, the flyers, or the bobbins, rapid rotary motions.

To a spinner this description of the invention would be amply sufficient to explain the whole of the proposed improvement; but as the Patentee has thought proper to give his reasons for substituting this mode of driving a throstle frame in preference to the ordinary mode, and has appended to his specification rather an elaborate drawing of a throstle frame, for the purpose of showing the mode by which he applies his invention, we shall give so much of his explanations as will fully develop the details of his plan.

Plate I., fig. 5, represents part of a throstle frame in elevation; fig. 6, is a plan or horizontal view of a portion of the throstle frame taken in the line of the warves and the friction band. The driving rigger *a*, being actuated by a strap from any first mover, gives rotary motion through the horizontal shaft *b*, to the bevel pinions or mitre gear *c*, and *d*, the latter of which is fixed upon the vertical shaft *e*, carrying the large pulley *f*. This pulley *f*, has two grooves, receiving the two endless bands *g*, *g*, which are kept tight by tension pulleys *h*.

The warves of the several spindles are shown at *i*, *i*, *i*, the band *g*, touching their peripheries, and which is kept tightly pressing against them by adjustable pressing pulleys *k*, *k*, *k*, for the purpose of creating friction.

The endless bands *g*, distended round their several ulleys, are thus brought into contact with the warves of the bobbins on each side, for the purpose of driving them by friction alone, instead of the ordinary mode of driving them by bands from a horizontal tin cylinder passed round the warves.

The Patentee says, the advantages to be derived from this plan are the saving of power, inasmuch as the driving band can be adjusted with sufficient pressure to drive the spindles, and no more; whereas, by the ordinary mode of driving throstles by a series of bands, some may be tight and some slack, but by these means the twist upon every bobbin may be regulated: also, dispensing with the drum causes a less agitation of air, and consequently a diminution of the ordinary vibrations of the machine.

In conclusion, the Patentee says, "I am fully aware that a series of spindles have already been driven by a continuous band passed in succession round the warves of each respective spindle; and also that spindles have in other machines been placed in curved positions, for the purpose of being driven by a band or strap impinging on one side of the warve: yet the arrangement hereinbefore described differing in many essential points from such well-known arrangements, I declare that I do not claim any separate or distinct parts of the machinery or apparatus hereinbefore described; but I do claim as my invention, the combination and arrangement of such parts by which a series of spindle warves, or other warves or tubes for spinning or twisting cotton, silk, flax, and other fibrous substances placed in a straight line, are driven or revolved by the motion of an endless band, strap, list, or cord, impinging on one side of such warve or tube; the pressure of such band against the respective warves being governed and determined by the positions of intermediate pressure pulleys, as described.—[*Inrolled in the Inrolment Office, May*, 1835.]

To William Hodge, *of Margaret-place, Dover-road, in the county of Surrey, hat dyer, for his having invented certain improvements in apparatus for dyeing hats.* —[Sealed 19th July, 1832.]

The Patentee describes his invention as consisting, firstly, in an improvement upon a patent granted to John Bowler, of Castle-street, Southwark, for certain improvements in machinery employed in the process of dyeing hats, dated 4th November, 1830. (See vol. viii. Second Series of London Journal, p. 81.) And, secondly, in substituting what he calls "suspenders," in place of the blocks heretofore in common use.

The first improvement merely consists in causing every other of the frames to which the "suspenders," or blocks, are to be attached, to slide in and out in grooves, for the purpose of more easily removing the said "suspenders," or blocks, when required. Plate I., fig. 7, represents the improved dyeing frame, consisting of two circular rims, *a*, *a*, which are connected together at top and bottom by three fixed perpendicular bars or framework *b*, *b*, *b*. Two other perpendicular frames *c, c,* similar to the former, slide in grooves *d, d, d, d,* fixed to the upper and lower rims. These grooves have anti-friction rollers in them, for the purpose of making the frames *c, c,* to slide in and out more freely. The suspenders or substitutes for blocks, by these means, may be more easily got at by drawing out the frames *c, c,* about half way, when the suspenders, which are attached to the frames with the hats upon them, may be easily reached, and either removed or altered in position; and when this is done on one side, the sliding frame may be brought out on the other, and the remaining quantity of "suspenders" undergo the same operation.

The Patentee remarks, that it is well known to all hat dyers, that after the hats have been in the dyeing liquor some time, they ought to be taken out and exposed to the action of the atmospheric air, they are then again immersed in the copper, that part of the hat which was uppermost in the first immersion being placed downwards in the second. This is done for the purpose of obtaining an uniform and regular dye. The Patentee's mode of carrying this operation into effect, is shown in the figure: *e, e,* are pivots for the dyeing frame to turn upon, which is supported by the arms *f,* from a crane above. The whole apparatus may be raised up or lowered into the copper by means of the crane or other mechanism. When the dyeing frame is raised out of the copper, the whole of the suspenders or blocks are reversed by turning the apparatus over upon the pivots *e, e,* and thus the whole surfaces of the hats are equally acted upon by the dyeing material.

It should be observed, that when the dyeing frame is raised up out of the copper, it should be tilted on one side, so as to make all the liquor run out of the hats, and also to cause the rims of the hats to hang down, and not stick to the body of the hat, and leave a bad place or uneven dye upon it. The second improvement described by the Patentee, is the construction of "suspenders" to be substituted instead of the ordinary blocks.

These "suspenders" are composed of thin plates of copper bent into the required form, that is, nearly resembling that of a hat block, and made in such a manner as to be capable of contraction and expansion to suit different sized hats, and keep them distended, which may be altered by the workman at pleasure, when it is required to place the hats upon them, or remove them therefrom. The dyeing frame at fig. 7, is shown with only two of these "suspenders," in order to prevent confusion. One of these suspenders is represented detached at fig. 8, which exhibits a side view, and fig. 9, a front view of the same. It will be seen by reference to the figure that the suspenders consist of two distinct parts, which may be enlarged or collapsed by a variety of means, and which means may be suggested by any competent mechanic. The two parts of the suspenders are proposed to be connected together by arms *g*, *g*, and at the junction of these arms a key is connected for turning them round when required. It will be seen on reference to the front view, fig. 9, that the "suspenders" or substitutes for blocks, are open at the top or crown part of the hat; this is for the purpose of allowing the dyeing liquor to penetrate.

The Patentee states in conclusion, that having now described his invention, and the manner of carrying the same into effect, he claims as his invention, firstly, the addition of the grooves *d*, *d*, for the purposes of sliding the frames in and out; and, secondly, the adaptation of the suspenders in lieu of the blocks now in ordinary use.—[*Inrolled in the Inrolment Office, January*, 1833.]

[There appears to be but a very slight shade of difference between this invention and two which have preceded it for the same purpose, the principles being the same, the form only being varied, viz., Buffum's Patent, vol. xiv., First Series of the London Journal, page 15, and Bowler's Patent above alluded to. See vol. viii. Second Series, page 81, to the latter the Patentee (as stated in his specification) intends to assign his entire Patent right.—Ed.]

To John Demeur, *of Water-lane, Tower-street, in the city of London, gentleman, for his having invented or found out a manufacture in the extraction of oleaginous matter from a certain foreign vegetable kernel, and the application of the said oleaginous matter to the making of oil, candles, soap, and other articles of commerce, a part of which invention has been communicated to him by a foreigner residing abroad.*—[Sealed 13th April, 1832.]

It is stated that the material commonly known as an article of commerce by the name of palm oil, is obtained from the outer husk of the palm nut, and is found in great abundance both in Africa and South America. In the manufacture of this palm oil, by the processes heretofore in use, the husk or outer shell is the only part employed for making the oil, the nut or kernel being always rejected as useless for that purpose. The Patentee states that he has found that a great quantity of oleaginous matter is contained in the kernel of this nut, and says that it may be extracted by any of the processes now in common use among oil manufacturers; but the process which he proposes to use is as follows:—

The kernels should be dried or baked just sufficiently to render them crisp when cold, they should then be ground into a fine paste in a mill of the same construction as those now in ordinary use for the purpose of extracting palm oil. This paste should be mixed with one-fourth its quantity by weight of boiling water, and then put into the crushing bags of the same kind as is commonly used; these bags should then be introduced into a press of the ordinary construction, the plates of which are to be heated, and the action of the heat and pressure together, will cause the oil to exude through the interstices of the bags, and run into proper reservoirs placed underneath for that purpose, and will then be ready for purification. The process of purification is performed by re-melting the last-mentioned product, and filtering it in a fluid state; and if it be thought desirable to purify and refine it still further, then this after process is performed in a metallic vessel lined with tin, keeping the oleaginous material constantly stirred, and occasionally pouring into it a quantity of very dilute sulphuric acid. This will precipitate any impurities, and any slight tinge of colour that may remain, and the oleaginous matter will, by its lesser specific gravity, remain on the surface of the water, from whence it is to be taken and further separated, by evaporating the aqueous particles.

The product of this process is a concrete compound of two distinct substances, called by modern chemists "*elain*" and "*stearine*." The elain, at the temperature of our atmosphere, is a very fine oil, which burns with great brilliancy in lamps, and the stearine at the same temperature is about the same consistency as wax or spermaceti.

This latter product may be made into very excellent candles, which will burn with about the same brilliancy as bees' wax. It may also be made into toilet and medicinal soap, for which it is peculiarly adapted, owing to its exceeding whiteness, and its possessing a fine aromatic violet odour.

The elain and stearine, in producing the last-mentioned materials, are separated by mechanical means, and without the assistance of artificial heat, providing the temperature of the atmosphere at the time is not below 65 deg. of Fahrenheit's thermometer; but if the temperature is below 65, then the compound ought to be heated by means of metallic plates up to 70 or 80 deg. of Fahrenheit, which renders it easier to work, and does not require such force to express the oil.

The products of this process are elain, or very fine oil; and the stearine, which make harder and better candles thanthe tallow in common use.

The Patentee says, that the candles made of stearine may be manufactured in the ordinary manner; and in conclusion states, that he claims as his invention or discovery, the use of the kernel of the palm nut for extracting oleaginous substances therefrom, whether the same be crushed at home or abroad; and also the manufacturing therefrom a liquid oil, for the purposes of burning, and also a concrete substance that may be advantageously used for making candles, soap, &c.—[*Inrolled in the Petty Bag Office, October,* 1832.]

To HENRY BOOTH, *of Liverpool, in the county of Lancaster, gentleman, for his invention of improvements applicable to locomotive steam-engines and railway carriages.*—[Sealed 23rd January, 1836.]

THESE improvements have two objects: first, a mode of stopping the railway engine and carriages gradually, by the employment of a throstle valve in the eduction pipe; and secondly, coupling or connecting together a series or train of railway carriages, by an apparatus to be employed in place of the ordinary tug-chain: by means of which improved contrivance, it is said, a superior steadiness of motion will be obtained when the carriages are proceeding with very great velocity.

The first apparatus described as applicable to the locomotive engine which draws the carriages on railways, is designed for checking the speed of the engine or stopping it altogether. It consists in the adaptation of a throstle valve, slide, or damper to the pipe, through which the eduction steam escapes. The most convenient situation for this throstle valve is considered to be " where the two pipes are united into one, below the place where the pipe is contracted in area, for the purpose of producing a blast in the furnace."

It has not been deemed necessary to give any drawing of this part of the apparatus; but it is stated, by way of description of the manner in which it is to be adapted, that " from the throstle valve must proceed a rod or long handle, extending through the chimney to the back part of the boiler, so as to lie within convenient reach of the engine-man, who, by moving the said handle, can close the slide or throstle valve either partially or altogether, as may be required; and the throstle valve need not be altogether steam-tight, but should be made to work freely.

"The engine-man, when he wishes to stop, or slacken the speed of the engine, closes or contracts this throstle valve, without shutting off the steam in its passage from the boiler to the engine; the pistons being by that means speedily, but not suddenly, checked, and the driving wheels of the engine no longer revolving, or revolving very slowly, the engine is brought to a stand."

The coupling apparatus is represented in Plate II., fig. 7: A, and B, are two railway carriages connected together by the screw-bolts *a, a,* and links or shackles *b, b*; attached to the hooks *c, c,* which are affixed by pins to the draw-bars *d, d,* of each carriage. The links *b, b,* being placed upon the hooks *c, c,* the two carriages A, and B, become coupled together. The screw bolts *a, a,* which have different threads or worms cut round them, the one a right-handed, the other a left-handed thread, are then turned round for the purpose of causing the links or shackles *b, b,* to approach each other. This brings the carriages nearer together, and the spring buffers *e, e, e, e,* into contact: the screw-bolt then receives a few more turns for the purpose of tightening the connexion, which is effected by the bolts and shackles drawing out the draw-bars *d, d,* a short distance, and thereby giving tension to the draw-springs to which the draw-bars are attached in the ordinary way; and the screw-bolt is prevented from turning, by a weighted lever or handle hanging down from the central joint.

By these means, a train of carriages moving very rapidly upon the lines of railway, obtain a combined steadiness and smoothness of motion, which they cannot have where the buffers of the coupled carriages are not brought into contact.

The Patentee says, in conclusion, "I do not claim as new, any particular kind of throstle valve; that may be left to the judgment of the engineer, provided it be so constructed that, when open, the steam-way shall not be contracted, but the steam be allowed to escape freely. But I claim the introduction of a throstle valve or damper into the exhausting steam-pipe of a locomotive engine, by closing or contracting which, the engineman can check or stop the engine at pleasure. And, as regards the coupling apparatus, I do not claim, as new, the separate parts, as the buffers, screw-chain, or draw-bar attached to a draw-spring; but I claim the combination and joint action of those parts as described, and the consequent close but elastic attachment of the carriages to each other, which constitutes my improvement as applied to railway carriages."—[*Inrolled in the Inrolment Office, July,* 1836.]

To Joshua Butters Bacon, *of Sidmouth-street, Regent-square, in the county of Middlesex, gentleman, for certain improvements in the construction of locomotive steam-carriages applicable to railways and common roads, being a communication from a foreigner residing abroad.* [Sealed 11th March, 1835.]

The particular feature of novelty proposed under this patent, is the mode of communicating the power of the steam-engine to the running wheels, for the purpose of propelling the carriage, which, instead of being affected through the agency of rods and cranks, or by toothed gear or riggers and bands, all of which modes have been heretofore employed for that purpose, it is now proposed to drive the carriage by means of friction applied to the peripheries of the running wheels.

From a very confused description, accompanied by a drawing, which appears to be considerably defective, we are enabled merely to give the general features of the scheme, which, however, is so obviously inapplicable to the purpose proposed, that our readers will feel no desire to be in possession of more minute details.

Plate II., fig. 1, represents the locomotive carriage in longitudinal elevation; fig. 2, being an end view of the same. The frame of the carriage is in the usual rectangular form, supporting the boiler *a*, and engine *b*; and in this case a box *c*, is placed behind upon the framework for the stowage of fuel, instead of dragging a tender after it. The running wheels *d*, *d*, and *e*, are of the ordinary construction, and are affixed to revolving axles as usual, their journals turning in axle boxes, which are capable of adjustment, for the purpose of bringing the engines to a true level. The steam-engine employed for exerting the driving power is of the rotary kind, consisting of a pair of arms, which revolve within a circular chamber *b*, the transverse sectional figure of which is nearly elliptical. The steam is admitted into this through the axle by a pipe *f*, at one side, and is discharged by a pipe *g*, into the chimney, or into the cylindrical water tank contiguous.

The power for driving is applied to the larger running wheels *e*, in the following manner:—At the end of the axle of the rotary engine there is a pinion *i*, taking into the teeth of a wheel *h*, turning upon an axle, which is supported by the swinging arm *j*: upon this same axle there is also fixed a conical roller or friction wheel *k*, having several steps or peripheries of different radii; one of which peripheries is intended to be brought into contact with the periphery of a wheel *l*, mounted upon an axle turning in an upright standard *m*. This wheel *l*, is not fixed upon its axle, but is connected thereto by what is called a feather, and therefore is capable of being slidden to and fro on its axle, for the purpose of being brought into coincidence with any of the steps of the wheel *k*, that might be desired; and their peripheries being so brought into contact, the rotation of the wheel *k*, will cause the wheel *l*, to revolve also. On the same axle as the wheel *l*, there is affixed a smaller friction wheel *n*, the periphery of which runs in contact with the periphery or the flange of the running wheel *e*.

The degree of friction created between these surfaces, in connexion, will, of course, depend upon their closeness of contact, which is regulated by drawing the periphery of the wheel *k*, against the wheel *l*, through leverage obtained by the engine-man in pulling the handle *o*; and the pressure of the friction wheel *n*, against the periphery of the running wheel *e*, is obtained by drawing down the standard *m*. Thus the peripheries being brought into close contact, the rotation of the pistons in the engine *b*, is intended to give such rotary motion to the wheels, as shall, by the friction of the surfaces, cause the running wheels to revolve and impel the carriage forward upon its line of railway.

The Patentee says, " The pressure of weight upon the driving wheels may be varied as follows :—Let the after-bearing wheels be raised by moving the arm *p*, which is a bent lever, toward the front of the carriage, until the weight of the engine is chiefly sustained upon the forward bearing wheels; and the driving wheels being placed sufficiently in rear of the centre of gravity, to sustain the weight in all ascending planes, when it is essential the weight should be thrown upon the driving wheels."

Again the Patentee observes, "When turning a bend in the road, the bearing wheels are made to turn by means of the arm or lever *q*, and the bars *r*; the longer of these bearing upon the extremity of the forward axle shoulder, and the shorter connecting the end of this compound lever, as seen at *s*; so that when the lever or arm *q*, is drawn toward the point, the longer bar is moved forward and the shorter back, and thereby the wheels are turned conformably to the bend of the road if the curve is to the left hand, and by a contrary movement of the lever if the bend is to the right."

In order to promote combustion in the furnace a fan-wheel is to be adapted, as shown at *t*; which fan may be made to revolve by a band from one of the wheels of the conical series above, and the wind will be conducted by a spout *v*, into the ash-pit of the close furnace. The water tank *u*, is connected with the boiler, by a steam pipe *w*, and by a water pipe *x*, so that by the former the pressure of steam in both vessels may be equalized, while the water is drawn or allowed to run through the latter into the boiler.

The Patentee says, "The construction of the smoke pipe as seen, is designed to prevent the cinders flying out of the pipe. It is so constructed as that there shall be within it at the bottom a space where there is no current, but into which the cinders are thrown by the force of the furnace; then ceasing to be impelled by this force they settle by their own gravity, while the smoke which has not been and could not be impelled into a space, where, from its structure there can be no current, ascends by the continued force of the furnace. This improvement in the structure of the smoke pipe is applicable to steam-boats and to standing engines, and is of great value from the security it affords against fire by cinders."

If this is really as great an improvement as the Patentee seems to consider it, how much is it to be regretted that he has not either in the description or the drawing, shown us what is the form of construction to which he attaches so much importance.

The Patentee says, in conclusion, that he claims, first, the combination of the roller *n*, with a pinion *i*, on the shaft of the rotary engine, and the rollers communicating the force of the engine (by friction we presume), to the driving wheels of the locomotive engine; together with the mode of increasing or diminishing the rolling friction of the same upon each other, and upon the driving wheels, and of the driving wheels upon the rail; secondly, the combination with a locomotive engine of a smoke pipe, constructed with a recess out of, or aside from, the current, so that the cinders may be thrown into it by the draft; thirdly, the combination of a lever with the hinder bearing wheels on each side, to throw the weight of the engine upon the driving wheels; and fourthly, the combination of levers with the bearing wheels, to change the direction of the bearing wheels conformably to the bends of the road.—[*Inrolled in the Inrolment Office, September,* 1835.]

To James Brown, *of Esk Mills, in the parish of Pennycuick, North Britain, paper-maker, for his invention of a certain improvement or certain improvements in machinery or apparatus for making paper.*—[Sealed 18th May, 1836.]

These improvements in machinery or apparatus for making paper, have for their object a better application of a vacuum under the endless wire cloth, or web, of paper-making machines, for the purpose of more effectually withdrawing the water from the paper-pulp as it passes from the pulp-vat to the couching roller; or to that part where the sheet of partially-drained pulp is taken up from the web, to be pressed or squeezed by rollers, to express the remaining portion of water preparatory to the rolling or pressing operation.

The Patentee states, that he is aware a vacuum has been heretofore applied to various paper-making machines, and more particularly to that description called cylinder machines, or rotary machines, in which the endless wire web, or cloth, is passed around a cylinder or drum, which revolves with the endless web; the vacuum being applied in the inside of such cylinder in various ways: but in all instances the box or chamber in which the vacuum is formed, and over which the endless web passes, carrying the paper pulp, has been invariably covered with some kind of perforated lid or cover, intervening between the interior of the box and the underside of the endless wire web, or cloth, thereby impeding the effective operation of the vacuum.

The present improvements *apply* more particularly to the horizontal or Fourdrinier paper-making machine, in which the endless wire cloth, or web, is passed over or along a horizontal table, formed by small supporting rollers; the pulp being partially drained as it proceeds from the pulp-vat to the couching roller. The novelty now proposed consists in applying the vacuum in a box or chamber under the horizontal wire cloth, or web, without any cylinder, and more particularly without any perforated covering or lid intervening between the said box or chamber, and the underside of the wire web, the wire cloth passing over the otherwise open box with the paper pulp, where it is equally and at all parts affected by the vacuum, without its operation being uninterrupted by any perforated lid or cover, or other intervening substance.

Plate II., fig. 3, is a sectional diagram of the operative parts of a Fourdrinier machine, taken longitudinally, with the improvement applied thereto: *a*, is the spout or shoot from which the paper pulp (shown by a dotted line) flows on to the endless wire cloth, or web, *b*, *b*, *b*; which web is supported by a series of small rollers *c*, *c*, *c*, and passed over the usual supporting and tension rollers *d*, *d*, to the couching roller *e*, from which the paper is carried in the ordinary manner.

The box or chamber *f*, in which the vacuum is formed, is placed directly under the endless wire web, supported in any convenient manner; several of the usual small rollers being removed to make room for it.

Fig. 4, is a plan or horizontal view of the box detached from the machine; fig. 5, is a cross section; and fig. 6, a longitudinal section of the same: *g*, *g*, are the sides and ends of the box, the top edge of which should be covered with leather for the endless web to pass over: *h*, is the pipe or passage for the exit of the air and water drawn through the wire web by the air pump; or this pipe may be connected to the condensing chamber *i*, where a vacuum may be formed by the condensation of steam therein, as is well known to all practical men, the condensed steam, air, and water, being drawn off by the pipe or passage *k*.

In order to make paper of different widths or sizes, the box or the space over which the endless web passes, exposed to the action of the vacuum, must be capable of being enlarged or contracted, so as to prevent the air being drawn through any part of the endless web, which is not covered by paper pulp. In order to effect this, it is proposed to construct the box or chamber with two small sliding pieces or shutters *l*, *l*, placed at the ends of the box, and next the underside of the endless wire web; and by moving these sliding pieces or shutters outward or inward, the open space over which the endless web and pulp passes, exposed to the vacuum chamber, may be enlarged or contracted at pleasure, and the vacuum made to operate upon a greater or less width of the paper pulp.

In conclusion, the Patentee says, " I would remark, that I do not intend to claim, as my invention, the application of a vacuum to all kinds of paper-making machines, as I am well aware that the same has been repeatedly applied to this purpose in cylindrical or rotary machines, or those in which a rotary cylinder is employed; but I do claim, as my invention, the application of the same to the horizontal web or wire-cloth of a Fourdrinier machine, in the manner herein described; that is to say, without the intervention of any cylinder, or any other thing intervening between the open space of the box or chamber in which the vacuum is produced, and the endless web or wire-cloth which carries the paper pulp: at the same time, I would remark, that proper arrangements may be made to support the wire web if thought necessary."—[*Inrolled in the Rolls Chapel Office, November,* 1836.]

Specification drawn by Messrs. Newton and Berry.

WROUGHT-IRON ROOFS FOR BUILDINGS.

To the Editor of the London Journal of Arts and Sciences.

SIR,—On a recent inspection of the works of the London and Birmingham Railway, now rapidly proceeding at Camden Town, I observed a very ingenious and simple construction of wrought-iron framing for a roof, erecting over what I understand to be the engine-house of the London depot. It is formed of slight T-shaped iron, and angle iron bars, with small round rods securely bolted together. I recollect some years ago seeing a roof of a somewhat similar structure erected at the manufactory of Mr. Twells, in Ann-street, Birmingham, which roof was, as I understood, designed by your ingenious friend, Dr. Church, of that town. I do not know who designed the roof now erecting at the railway depot, but I presume Messrs. Cubitt, the eminent builders of Gray's Inn-road, as I am informed they are contractors for the whole of the works.

The framing of the roof in question at the railway is one of the lightest and strongest, for its weight of metal, that I have seen, excepting the one at Birmingham, to which I have alluded, and to which I decidedly give the preference. No account of either is, I believe, published, but I hope, through the medium of your widely disseminating journal, that both these ingenious plans will become more generally known, and consequently useful to the public.

The accompanying figures will serve to illustrate the two constructions. Plate II., fig. 8, is a diagram of the framing of the roof formed by Dr. Church; and fig. 9, is also a diagram, representing that erecting at the railway-works above-mentioned. In the first construction, shown at fig. 8, *a, a, a,* are the rafters; *b, b,* the horizontal tie-beam; *c, c,* the oblique tie-rods, each forming a triangle with the rafters and tie-beam, as *a, a, d, a, a, d*; and *e, e,* are the props supporting the middle of each rafter at the point *d.* This system of ties and props may be carried to any extent, as shown by dotted lines in the figure, for the purpose of giving additional support, if desired.

In the latter construction, adopted at the railway station, shown at fig. 9, *a, a, a,* are the rafters; *b, b,* the tie-beam; *c, c,* the tension rods, and *d, d,* the resisting props. I do not see the advantage of this variation from the original plan; it certainly forms an elegant and substantial framing for a roof, but does not, in my opinion, possess the same degree of strength, nor does it appear to be founded upon such correct scientific principles; I, therefore, greatly prefer the construction adopted by Dr. Church.

I am, Sir, yours, &c.

M. B.

NEW PATENT LAWS.

The second reading of Mr. Mackinnon's Bill in the House of Commons, for amending the laws relative to Patents, has been postponed *sine die,* and it is probable will not be proceeded with.

List of Patents

Granted by the French Government from the 1st of January, **1836.**

PATENTS FOR FIFTEEN YEARS.

To John Spear, of St. John's Wood, England, represented in Paris by Mr. Perpigna, Advocate, of the French and Foreign Office for Patents, 2ter Rue Choiseul, for improvements in machines employed for spinning and doubling cotton, flax, and other fibrous substances.

— Samuel Faulkner, of England, represented in Paris by Mr. Perpigna, for improvements in cards used for carding cotton or other fibrous substances.

— John Buchanan, of Ramsbottom, represented in Paris by Mr. Perpigna, for improvements in machines for cylinder printing, which machines may be applied for printing paper, calico, and other fabrics.

— Theodore Schwartz, of Stockholm, represented in Paris by Mr. Perpigna, for a new application of known principles to produce a mechanical power.

— William Keene, civil engineer, of Bordeaux, represented in Paris by Mr. Perpigna, for a new system of motive power applicable to navigation.

— Michel Eisenmenger, professor of music, represented in Paris by Mr. Perpigna, for an improved piano, for registering the notes as rapidly as they are played.

— John George Bodmer, of Bolton-le-Moors, represented in Paris by Mr. Perpigna, for an improvement in the machines used for roving and spinning either cotton, wool or any other fibrous substance.

— Samuel Colt, of the United States of America, represented in Paris by Mr. Perpigna, for improvements in the construction of fire-arms.

— Jean Baptiste Claviere, civil engineer, represented in Paris by

Mr. Perpigna, for improvements connected with locomotive carriages.

To Francois Peyre, of Marseille, represented in Paris by Mr. Perpigna, for a process for rendering sea water sweet.

— Alphonse Ambert Valois, of Lyon, for a method of producing, reproducing, and reducing to various dimensions every kind of sunk or raised engraving.

— Claude Perret, of Lyon, for improvements in the manufacturing of sulphuric acid.

— Decan and Co., of Belleville, near Paris, for improvements in mechanical lamps.

— Charles Clarkson, of London, for an hydro-pneumatic machine.

— Hyacinthe Pitay, of Paris, for an improved animal charcoal.

— Jean Stoddard, of Paris, for improvements in locomotive carriages.

— Ipay Brothers, of Veaucourt, for a planing machine.

— Miss Eliza Caroline Edward, of Rouen, for a new method of attracting the fishes either in the sea or in rivers.

— Francois Larroque, of Marmande, for an improved organ.

— Joseph Eboli, of Paris, for an imitation wax candle.

— Louis Emile Tabarié, of St. André, for an improved system of baths.

— Joel Spiller, of London, for an improved steam generator.

— Jean Baptiste Le Pere, of Paris, for improvements in pianos.

— Jeremiah Barret, of London, for a machine for cutting corks of all dimensions.

— Eugene Fernier, of Paris, for a process for making all kinds of spirituous and acetous liquors sparkle and froth.

— Pierre Jean Simon Sol, of Paris, for an improved machine for washing by steam.

— Frederic Sauvage, of Paris, for a machine for reducing and increasing the dimension of statues.

— Pierre Francois Caron, of Paris, for a process of manufacturing plaited fabrics with permanent plaits.

— Hoene Wronski, of Paris, for a new mechanical agent by means of gravitation.

To Ehrsam and Tmer, of Marseille, for improved machinery for preparing cocoons, drawing off, milling, carding and spinning the refuse and waste silk proceeding from the cocoons.

— Aimé Grimaud, of Paris, for a new paddle wheel.

— Joseph Alexandre Boudin, of Avallon, for a new system of clock-work.

— Theophile Joseph Banse, of Lyon, for the process of manufacturing a new kind of crape with raw silk.

— Onesiphore Pecqueur, of Paris, for a press for extracting the juice of the grated beet-root, in the process of manufacturing beet-root sugar.

— Victor Athanase Pierret, of Paris, for a machine for sawing wood into a thin continuous sheet for the purpose of veneering.

— Joseph Skinner, of New York, for a machine for cutting wood into small pieces for various purposes.

— Besancenot, Duval, and Iozin, of Paris, for a process of trimming plate glass.

— Desgranges and Renaux, of Paris, for an improved kind of bridge.

— Brevet Senior, of Pilhiviers, for boxes of a new description for the wheels of waggons.

— Edmond remy, of Paris, for an improved furnace for manufacturing animal charcoal.

— Michel Antoine Guicheux, for an improved kind of cabriolet.

PATENTS FOR TEN YEARS.

— William Newton, civil engineer, of London, represented in Paris by Mr. Perpigna, for improvements in pens, pen-holders, and pen-cutters.

— Patrick Mackie, of London, represented in Paris by Mr. Perpigna, for an improved washing machine.

— Alexandre Fichet, locksmith, represented in Paris by Mr. Perpigna, for an improved safety lock, proof against any false keys.

— John Brookes, of Manchester, represented in Paris by Mr. Perpigna, for improvements in the preparing of certain colours used for printing calicos and other fabrics.

To Auguste Ranglet, of Versailles, represented in Paris by Mr. Perpigna, for a new system of whitening the substances used for making paper.

— Ferry, instrument maker, at Mirecourt, represented in Paris by Mr. Perpigna, for a new method of inlaying ornaments in tortoise-shell, horn, and whalebone.

— Dominique Adrien Cabarrus, of Bordeaux, for a portable system of railroads.

— Henri Lecoq, of Paris, for a process of manufacturing coffee with Indian corn.

— Joseph Gauthier, of Beaumotte, for improvements in the process of fining iron.

— Jean Pouthon, of Nimes, for certain improvements on the Jacquart frame.

— Moses Poole, of London, for improvements in tea and coffee pots and tea kettles.

— Athanas Michel, of Orleans, for an improved gun.

— John Burrows, of London, for a method of manufacturing stucco, mortar, and cements.

— Bizeard Féodiere, of Paris, for improvements in lamps.

— Thomas Wilson, of London, for an improved kind of soap.

— Balm and Hussenet, of Paris, for a rotary pump.

— ean Baptiste Gautherin, of Bordeaux, for reducing into syrup the water melon, and extracting alcohol from such juice.

— Daublaine and Co. of Paris, for improvements on organs.

— Joseph Vallod, of Paris, for a method of preventing the livre flour from flying about the mill.

— Chauveray and Joubert, of Paris, for a new motive power with a circular lever.

— August Gilbert, for an improvement in stays for ladies.

— Fillion, of Paris, for a machine for manufacturing gloves.

— Bernard Canonier and Duclos, of Paris, for a new hydraulic motive power.

— Saint Valery Scheult, of Nantes, for a sugar boiling apparatus.

(*To be continued.*)

List of Patents

Granted in Scotland between 22nd January and 22nd March, 1837.

To George Goodlett, of Leith, merchant, for a new and improved mode of distilling spirit from wash and other articles; also applicable to general purposes of rectifying, boiling and evaporating or concentrating.—25th January.

— Charles Wheatstone, of Conduit-street, London, musical instrument manufacturer, and John Green, of Soho-square, musical instrument manufacturer, for a new method or methods of forming musical instruments in which continuous sounds are produced from strings, wires, or springs.—31st January.

— To Peter Spence, of Henry-street, Commercial-road, London, chemist, for certain improvements in the manufacture of Prussian blue, prussiate of potash, and plaster of Paris.—10th February.

— Miles Berry, of the Office for Patents, 66, Chancery-lane, London, patent agent and mechanical draftsman, in consequence of a communication from a foreigner residing abroad, of an improved apparatus for torrefying, baking, and roasting vegetable substances; which, with certain modifications and additions, is also applicable to the evaporation and concentration of saccharine juices and other liquids.—15th February.

— John Gemmell, of Stockwell-street, Glasgow, merchant, for certain improvements in steam and other boats or vessels, which are partly applicable to other purposes.—19th February.

— Moses Poole, of Lincoln's Inn, London, gentleman, in consequence of a communication made to him by a foreigner residing abroad, for improvements in anchors and in friction-rollers, to facilitate the lowering and raising such and other anchors; which friction-rollers are applicable for other purposes.—20th February.

— James Cook, gun manufacturer, of Birmingham, for improvements in gas burners.—22nd February.

— Francois de Fauch, of Percy-street, Bedford-square, London, military engineer to the King of Bavaria, for improvements in apparatus or machinery for propelling of vessels for raising water, and for various other purposes.—24th February.

To John Isaac Hawkins, of Chase-cottage, Hampstead-road, civil engineer, in consequence of a communication made to him by a foreigner residing abroad, for certain improvements in the application of the production of combustion in generating and n aiding of steam for giving motion to steam-engines.—4th March.

— William Wright, of Salford, in the county of Lancaster, machine maker, for improvements in twisting machinery used in the preparation, spinning, or twisting of cotton, flax, silk, wool, hemp, and other fibrous substances.—6th March.

— Peter Ascadius Tealdi, formerly of Mondoir, in Piedmont, but now residing in Manchester, in consequence of a communication made to him by a foreigner residing abroad, for a new extract or vegetable acid, obtained from substances not hitherto used for that purpose, which may be employed in various processes of manufacture, and in culinary or other useful purposes, together with the process of obtaining the same.—6th March.

— John Burns Smith, of Salford, in the county of Lancaster, spinner, and John Smith, of Halifax, dyer, for a certain method or methods of tentering, stretching, or keeping out cloth to its width (made either of cotton, silk, wool, or any other fibrous substances) by machinery.—6th March.

— Edmund Shaw, of Fenchurch-street, London, stationer, in consequence of a communication made to him by a foreigner residing abroad, for an improvement in the manufacture of paper.—8th March.

— John Shaw, of Richworth, in the county of Halifax, book-keeper, for improved machinery in preparing wool, and also in preparing the waste of cotton wool for spinning.—9th March.

— George Bertie Paterson, of Peacock-street, in the parish of St. Mary, Newington, in the county of Surrey, engineer, for certain improvements in the construction of meters or apparatus for measuring gas or liquids.—14th March.

To Thomas Theophilus Biggs, of Queen Ann-street, Cavendish-square, London, in consequence of a communication made to him by a foreigner residing abroad, for improvements in certain descriptions of fire-arms.—17th March.

— John Leberecht Steinhaueser, of Upper-terrace, Islington, London, merchant, in consequence of a communication made to him by a foreigner residing abroad, for improvements in hand and power looms.—17th March.

— Fletcher Woolley, of York-street East, Commercial-road, London, for improvements in the manufacture or preparation of materials to be used as a substitute for bees' wax parts of which improvements are applicable to other purposes.—17th March.

— Neil Snodgrass, of Glasgow, engineer, for improvements in steam-engines and other mechanism of steam-boats, which were partly communicated by a foreigner abroad, and partly invented by himself.—21st March.

— Miles Berry, of the Office for Patents, 66, Chancery-lane, London, mechanical draftsman, in consequence of a communication made to him by a foreigner residing abroad, for certain improvements in cleaning, purifying, and drying wheat and other grain or seeds.—22nd March.

New Patents
SEALED IN ENGLAND,
March, 1837.

To David Stevenson, of Bath-place, New-road, in the county of Middlesex, gentleman, for a new method of preparing writing paper, from which writing ink cannot be expunged or abstracted without detection, being partly a communication from a foreigner residing abroad.—Sealed 2nd March—6 months for inrolment.

To Thomas Bradshaw Whitfield, of New-street-square, in the county of Middlesex, lamp manufacturer, for his invention of improvements in producing parallel motion to the piston rods of pumps for lamps and other purposes, which improvements are also applicable to machinery in general, where parallel motion is required.—Sealed 4th March—6 months for inrolment.

To Samuel Stocker, of Bristol, gentleman, for his invention of improvements in pumps.—Sealed 4th March—6 months for inrolment.

To Charles Francois Edward Aulas, of Grande Rue Verte, Paris, in the kingdom of France, gentleman, but now residing in Cockspur-street, in the county of Middlesex, for his invention of an improvement or improvements in preparing writing paper, so as to prevent the discharge of the ink therefrom without detection, and to prevent the falsification of writing thereon.—Sealed 6th March—6 months for inrolment.

To Henry Backhouse, of Walmsley, in the parish of Bury, calico printer, and Jeremiah Grime, of Bury, both in the county of Lancaster, engraver, for their invention of certain improvements in the art of block printing.—Sealed 7th March—6 months for inrolment.

To John Shaw, of Rishwarth, in the parish of Halifax, in the county of York, book-keeper, for his invention of improved machinery in preparing wool, and also in preparing the waste of cotton wool for spinning.—Sealed 7th March—6 months for inrolment.

To John Consitt, of Manchester, in the county of Lancaster, mechanist, for his invention of certain improvements in the machinery used for spinning, doubling, and twisting cotton and other fibrous substances.—Sealed 8th March—6 months for inrolment.

To Charles William Celarier, of St. Paul's-chain, in the city of London, Esq., for certain improvements on lamps, particularly for causing the oil to ascend; which improvements, or parts thereof, are applicable to the raising of water and other liquids, being a communication from a foreigner residing abroad.—Sealed 10th March—6 months for inrolment.

To Neil Snodgrass, of Glasgow, in the county of Lanark, engineer, for his invention of improvements in steam-engines and other mechanism of steam-boats—Sealed 15th March—6 months for inrolment.

To Henry Christopher Windle, of Walsall, in the county of Stafford, merchant, Joseph Gillott, of Birmingham, in the county of Warwick, metallic pen manufacturer, and Stephen Morris, of Birmingham, aforesaid, artisan, for their invention of improved means of giving elasticity, reedom of action, and durability to certain parts of pens or instruments used in writing, as also of obtaining a supply and flow of ink to the same.—Sealed 15th March—2 months for inrolment.

To Charles Francois Edward Aulas, of Grande Rue Verte, Paris, in the kingdom of France, gentleman, but residing in Cockspur-street, in the county of Middlesex, for a new and improved method of cutting and working wood by machinery, being a communication from a foreigner residing abroad.—Sealed 15th March—6 months for inrolment.

To Richard Macnamara, of Hunter-street, in the borough of Southwark, gentleman, for his invention of certain improvements in paving, pitching, or covering streets, roads, and other ways, which improvements are applicable to other purposes.—Sealed 15th March—6 months for inrolment.

To Henry Davies, of Stoke Prior, in the county of Worcester, engineer, for his invention of certain improved apparatus or machinery for obtaining mechanical power; also certain improved apparatus or machinery for impelling or raising fluids.—Sealed 15th March—6 months for inrolment.

To William Maugham, of Newport-street, Lambeth, in the county of Surrey, chemist, for his invention of improvements in the manufacture of white lead.—Sealed 15th March—6 months for inrolment.

To James Walton, of Sowerby-bridge Mills, in Wavley, in the parish of Halifax, in the county of York, woollen manufacturer and frizer, for his invention of improvements in machinery for manufacturing and finishing of woollen and some other cloths.—Sealed 21st March—6 months for inrolment.

To Moses Poole, of Lincoln's Inn, gentleman, for improvements in making fermented liquors, being a communication from a foreigner residing abroad.—Sealed 21st March—6 months for inrolment.

To Robert Neilson, of Liverpool, in the county of Lancaster, gentleman, for his invention of a machine for preparing and clearing coffee from the pod or husk, and separating the different qualities, so as to render it better adapted for the purposes of roasting and consumption.—Sealed 21st March—2 months for inrolment.

To Miles Berry, of Chancery-lane, in the parish of St. Andrew, Holborn, in the county of Middlesex, patent agent and mechanical draftsman, for certain improvements in machinery for heckling or combing, and preparing and roving hemp, flax, tow, and other vegetable fibrous materials, being a communication from a foreigner residing abroad.—Sealed 27th March—6 months for inrolment.

To Joseph Whitworth, of Manchester, in the county-palatine of Lancaster, engineer, for his invention of certain improvements in machinery, tools, or apparatus for turning, boring, planing, and cutting metals and other materials.—Sealed 28th March—6 months for inrolment.

To Joseph Haley, of Manchester, in the county of Lancaster, machine-maker, for his invention of certain improvements in the machinery, tools, or apparatus for cutting, laning, and turning metals and other substances.—Sealed 28th March—6 months for inrolment.

To Henry Stephens, of Stamford-street, Blackfriars-road, in the parish of Christ Church, and county of Surrey, writing fluid manufacturer, for his invention of certain improvements in ink-stands or ink-holders, and in pens for writing.—Sealed 28th March—6 months for inrolment.

METEOROLOGICAL JOURNAL,

FOR FEBRUARY AND MARCH, 1837.

	Thermo.		Barometer.		Rain in inches.
1837.	Hig.	Low.	High.	Low.	
Feb.					
26	41	25	30,10	30,07	
27	41	26	29,96	29,88	
28	41	30	30,09	29,95	
March					
1	39	24	30,31	30,24	
2	41	25	30,26	30,15	
3	43	25	30,20	30,11	
4	43	32	30,04	29,97	,05
5	47	26	30,02	29,83	
6	44	33	29,93	29,84	
7	46	29	30,06	29,96	
8	48	25	30,11	30,06	
9	50	32	30,10	29,89	
10	48	35	29,64	29,30	
11	46	30	29,29	29,27	,0125
March					
12	42	20	29,46	29,28	
13	43	27	30,08	29,70	,0125
14	43	26	30,22	30,20	
15	44	30	30,11	30,01	
16	42	31	30,05	29,99	,0125
17	41	31	30,19	30,17	
18	44	31	30,17	30,02	,0125
19	41	24	29,99	29,91	
20	37	24	29,87	29,83	
21	37	17	29,86	29,72	
22	39	22	29,72	29,70	
23	39	19	29,68	29,66	
24	38	15	29,75	29,65	
25	41	23	29,74	Stat.	

Edmonton. CHARLES HENRY ADAMS.

Latitude 51° 37 32 N.

Longitude 3 51 West of Greenwich.

CELESTIAL PHENOMENA, for April, 1837.

D.	H.	M.	
1			Clock before the ☉ 3m. 57s.
	—		☽ rises 4h. 42m. M.
	—		☽ passes mer. 8h. 54m. M.
	—		☽ sets 1h. 18m. A.
	7		☽ in Perigee.
	12	14	♃'s fourth sat. will im.
	23	38	♅ in conj. with the ☽ diff. of dec. 3. 55. N.
2	17	29	☿ in conj. with ♀ diff. of dec. 0. 38. S.
	20	31	♀ greatest Hel. Lat. S.
3	8	11	♃'s third sat. will im.
	11	44	♃'s third sat. will em.
	14	30	♃ stationary.
	21	13	♀ in conj. with the ☽ diff. of dec. 1. 12. N.
	22	36	☿ in conj. with the ☽ diff. of dec. 0. 35. N.
4			☉ eclipsed, invis. at Greenwich.
	9	54	♃'s first sat. will em.
5			Clock before the ☉ 2m. 45s.
	—		☽ rises 5h. 43m. M.
	—		☽ passes mer. 0h. 14m. A.
	—		☽ sets 7h. 4m. A.
	7	20	Ecliptic conj. or ● new moon.
10			Occul. c. Tauri, im. 6h. 41m., em. 6h. 53m.
	—		Clock before the ☉ 1m. 20s.
	—		☽ rises 7h. 29m. M.
	—		☽ passes mer. 4h. 24m. A.
	—		☽ sets 0h. 23m. M.
	12	20	♃'s third sat. will im.
11	11	49	♃'s first sat. will em.
12	11	13	☽ in □ or first quarter.
13	4		☽ in Apogee.
	15	59	♃ in conj. with the ☽ diff. of dec. 4. 30. S.
	19	16	Juno in oppo. ☉ intens. of light 0.391.
	23	5	♂ in conj. with the ☽ diff. of dec. 2. 45. S.
14	17	53	☿ in sup. conj. with the ☉
15			Clock before the ☉ 0m. 1s.
	—		☽ rises 0h. 39m. A.
	—		☽ passes mer. 8h. 30m. A.
	—		☽ sets 3h. 46m. M.
	—		Mercury R. A. 1h. 35m. dec. 9. 21. N.
	—		Venus R. A. 1h. 3m. dec. 5. 16. N.
			Mars R. A. 8h. 59m. dec. 10. 44. N.
15			Vesta R. A. 21h. 47m. dec. 15. 20. S.
	—		Juno R. A. 13h. 44m. dec. 0. 34. N.
	—		Pallas R. A. 0h. 3m. dec. 0. 8. N.
	—		Ceres R. A. 1h. 50m. dec. 4. 33. N.
	—		Jupiter R. A. 8h. 44m. dec. 19. 5. N.
	—		Saturn R. A. 14h. 54m. dec. 13. 58. S.
	—		Georg. R. A. 22h. 37m. dec. 9. 34. S.
	—		☿ passes mer. 0h. $1\frac{2}{10}$m.
	—		♀ passes mer. 23h. 30m.
	—		♂ passes mer. 7h. 24m.
	—		♃ passes mer. 7h. 9m.
	9	2	♃'s second sat. will em.
18	9	55	☿ in the ascending node.
	11	2	♃'s fourth sat. will em.
20			Clock after the ☉ 1m. 9s.
	—		☽ rises 6h. 56m. A.
	—		☽ passes mer. morning.
	—		☽ sets 4h. 48m. M.
			Total Eclipse of the Moon.
	5	47	First contact with Penumbra
	6	49	First cont. with dark shadow.
	7	50	First total immersion in dark shadow.
	8	40	Middle of eclipse.
	9	30	Last total immersion in dark shadow.
	10	31	Last cont. with dark shadow.
	11	33	Last contact with Penumbra.
	—		At Greenwich, the Moon will rise partially eclipsed at 6h. 56m.
	8	40	Ecliptic opp. or ○ full moon.
	8	13	♃'s first sat. will em.
21	12	10	♄ in conj. with the ☽ diff. of dec. 4. 4. N.
22	11	38	♃'s second sat. will em.
	23	26	☿ in Perihelion.
25			Clock after the ☉ 2m. 9s.
	—		☽ rises 0h. 30m. M.
	—		☽ passes mer. 3h. 48m. M.
	—		☽ sets 7h. 3m. M.
26	29		☽ in Perigee.
27	6	57	☽ in □ or last quarter.
	10	[illegible]8	♃'s first sat. will em.
29	3	51	♃ in □ with the ☉
	8	6	♅ in conj. with the ☽ diff. of dec. 3. 52. N.

J. LEWTHWAITE, Rotherhithe.

THE

London

JOURNAL AND REPERTORY

OF

Arts, Sciences, and Manufactures.

CONJOINED SERIES.

No. LXII.

Recent Patents.

To Thomas Greig, *of Rose Bank, in the parish of Bury, in the county of Lancaster, calico printer, for his invention of a mode of embossing and printing, at one and the same time, by means of a cylinder or roller on goods or fabrics made of or from cotton, silk, flax, hemp, and wool, or any one or more of these materials, or on paper.*—[Sealed 10th November, 1835.]

This invention consists in a novel adaptation and arrangement of machinery for embossing and printing silk, cotton, woollen, paper, and other fabrics or goods, in one or more colours, at one operation, either simultaneously, or consecutively, by means of revolving cylinders.

The construction of this machinery in its combined form, and its mode of operating, will be understood by reference to the drawing in Plate III.; and the following explanation thereof, fig. 1, in Plate III., exhibits a front elevation of the printing and embossing machine; fig. 2, is an end view of the same; fig. 3, represents the reverse end; and fig. 4, is a vertical section, taken through the machine in the same direction and parallel to fig. 2; the respective letters of reference indicating the same parts in all the figures.

The machine, as represented in the drawing, is furnished with three distinct printing cylinders of copper or other suitable material A, B, C, with their necessary appendages, for printing three different colours upon the fabric as it passes through the machine: either of these cylinders A, B, or C, may be employed as an embossing cylinder, without performing the printing process, or may be made to effect both operations at the same time.

The fabric or goods to be operated upon being first wound tightly upon a roller, that roller is to be mounted upon an axle or pivot, bearing in arms or brackets at the back of the machine, as shown at D. From this roller the fabric *a, a, a, a,* is conducted between tension rails, and passed under the bed cylinder or paper bowl E, and from thence proceeds over a carrier roller F, and over steam boxes not shown in the drawing, or it may be conducted into a hot room, for the purpose of drying the colours.

The cylinders A, B, and C, having either engraved or raised surfaces, are connected to folding rollers *b, b, b,* revolving in the ink or colour troughs *c, c, c*; or endless felts called sieves may be employed, as in ordinary printing machines, for supplying the colour, when the device on the surface of the cylinders are raised: these cylinders may be furnished with doctors or scrapers when required, or the same may be applied to the endless felts.

The printing cylinders may be driven by gear, and pressed against the paper bowl in the way exhibited in the drawing, or by any other convenient means, the particular manner of doing which is not claimed as any part of the invention, but is exhibited for the purpose of rendering the construction and adaptation of all the parts of the machine evident.

The situations of the doctors, when required to be used for removing any superfluous colour from the surface of the printing cylinder, are shown at *d*, *d*, *d*; those for removing any lint which may attach itself at *e*, *e*, *e*. They are kept in their bearings by weighted levers and screws, and receive a slight lateral movement to and fro, by means of the vertical rod *m*, which is connected at top to an eccentric on the end of the axle of the roller H, and at its lower end to the horizontal rod *n*, mounted at the side of the frame, (see fig. 2,) to this horizontal rod arms *o*, *o*, *o*, are attached, which are connected to the respective doctors; and thus by the rotation of the eccentric, the doctors are made to slide laterally.

When the cylinders A, B, or C, are employed for embossing only, those doctors will not be required. The driving power is communicated to the machine from any first mover through the agency of the toothed gear, shown in fig. 2, which gives rotary motion to the cylinder B, and from thence to the other cylinders A, and C, by toothed gear shown in figs. 1, and 3. The gudgeons of the cylinders A, and C, are supported in blocks *f*, *f*, sliding in brackets formed on the side frames of the machine; which blocks have adjustable screws *g*, *g*, for the purpose of bringing the cylinders up against the paper bowl, with any required degree of pressure: the cylinder B, is supported by its gudgeons running in blocks *h*, which blocks slide in the lower parts of the side frames, and are connected to perpendicular rods *i*, having adjustable screw nuts.

The lower parts of these rods bear upon weighted levers *k*, *k*, extending in front of the machine; and by increasing the weights *l*, *l*, any degree of upward pressure may be given to the cylinder B.

The colour boxes or troughs *c*, *c*, *c*, carrying the feeding rollers *b*, *b*, *b*, are fixed on boards which slide in grooves in the side frames, and the rollers are adjusted and brought into contact with the surface of the printing cylinders by screws *f*, *f*, *f*.

If a back cloth should be required to be introduced between the cylindrical bed or paper bowl E, and the fabric *a*, *a*, *a*, as the ordinary felt or blanket that may, for printing and embossing cotton, silk, or paper, be of linen or cotton; but if woollen goods are to be operated upon, a cap of felt, or some such material, must be bound round the paper bowl, and the felt or blanket must be used for the back cloth which is to be conducted over the rollers H, and I.

For the purpose of embossing the fabric, either of the rollers A, B, or C, may be employed, observing that the surface of the roller must be cut, so as to leave the pattern or device elevated for embossing velvets, plain cloths, and papers, but for woollens the device must be excavated, that is, cut in recess.

The pattern of the embossing cylinder will by the operation be partially marked through the fabric on to the surface of the paper bowl E: to obliterate which marks from the surface of the bowl, as it revolves the iron cylindrical roller G, is employed; but as in the embossing of the same patterns on paper, a counter roller is required to produce the pattern perfectly, the iron roller is in that case dispensed with, the impression given to the paper bowl being required to be retained on its surface until the operation is finished.

In this case the relative circumferences of the embossing cylinder, and of the paper bowl, must be exactly proportioned to each other; that is, the circumference of the bowl must be equal, exactly to a given number of circumferences of the embossing cylinder, very accurately measured, in order to preserve a perfect register, or coincidence, as they continue revolving between the pattern on the surface of the embossing cylinder, and that indented into the surface of the paper bowl.

The axle of the paper bowl E, turns in brasses fitted into slots in the side frames, and it may be raised by hand from its bearings, when required, by a lever K, extending in front. This lever is affixed to the end of a horizontal shaft L, L, crossing the machine seen in figs. 1, and 4: at the back of which shaft there are two segment levers *p, p*, to which bent rods *q, q*, are attached, having hooks at their lower ends, passed under the axle of the bowl. At the reverse end of the shaft L, a ratchet-wheel *r*, is affixed, and a pall or click *s*, mounted on the side of the frame (see fig. 3,) takes into the teeth of the wheel *r*, and thereby holds up the paper bowl when required.

When the iron roller G, is to be brought into operation, the vertical screws *t, t*, mounted in the upper parts of the side frames, are turned, in order to bring down the brasses N, which carry the axle of that roller and slide in slots in the side frames.

The cylinders A, B, and C, are represented hollow, and may be kept at any desired temperature during the operation of printing, by introducing steam into them; and under the colour boxes *c, c, c*, hollow chambers are also made for the same purpose. The degree of temperature required to be given to these must depend upon the nature of the colouring material, and of the goods operated upon. For the purpose of conducting steam to these hollow cylinders and colour boxes, pipes, as shown at *v*, *v*, *v*, are attached, which lead from a steam boiler. But when either of these cylinders are employed for embossing alone, or for embossing and printing at the same time, and particularly for some kind of goods where a higher temperature may be required, a red-hot heater is then introduced into the hollow cylinder in place of steam.

If the cylinder B, is employed as the embossing cylinder, and it is not intended to print the fabric by that cylinder simultaneously with the operation of embossing, the feeding roller *b*, must be removed, and also the colour box *c*, belonging to that cylinder; and the cylinders A, and C, are to be employed for printing the fabric, the one applying the colour before the embossing is effected, the other after it. It is, however, to be remarked, that if A, and C, are to print colours on the fabric, and B, to emboss it, in that case it is preferred, where the pattern would allow it, A, and C, are wooden rollers having the pattern upon their surfaces, and not metal, as the embossing cylinders must, of necessity, be.

It will be perceived that this machine will print one, two, or three colours at the same time, and that the operation of embossing may be performed simultaneously with the printing, by either of the cylinders A, B, or C; or the operation may be performed consecutively by the cylinders, either proceeding, or succeeding, each other.—[*Inrolled in the Rolls Chapel Office, May,* 1836.]

Specification drawn by Messrs. Newton and Berry.

To John De Burgh, *Marquis of Clanricarde, in consequence of a communication made to him by a foreigner residing abroad, for certain improvements in fire-arms, and in the projectiles used therewith.*—[Sealed 15th July, 1831.]

The subjects of this patent are, in the first place, a blunderbuss of a peculiar construction; and, secondly, a novel formation of shot-cartridge to be used therewith.

The blunderbuss has a moveable false breech, or that part of the barrel in which the charge is to be placed is made moveable, for the purpose of conveniently depositing the charge therein, without introducing it at the muzzle of the barrel.

This false breech, or moveable portion of the barrel, is tapered at its end, and, when fixed, is slidden into a countersunk recess in the stationary part of the barrel, and is held firmly by a wedge inserted behind it at the breech. When the piece is to be loaded, a thumb-lever lifts up the wedge; the moveable portion of the barrel or false breech is then slidden back, and its end raised to such an elevation as shall admit of the shot-cartridge being introduced into it; and when that is done, the false breech is lowered into its former place of coincidence with the barrel, and is pushed forward into close connexion with the barrel, and is then made secure by bringing down the wedge-piece behind it.

A nipple, having the touch hole-through it, is fixed upon the false breech for the purpose of receiving a detonating cap, which, when the piece is to be fired, is struck by the hammer of the gun-lock in the ordinary way.

The shot, or loading of lead, is formed of a cylindrical figure, sufficiently long to be cut into three lengths, each of these is to be divided longitudinally by cross sections into four, making the whole loading of lead into twelve pieces: the object of which is, that when fired, the shots, or rather slugs, so produced, may spread as they pass from the trumpet mouth of the blunderbuss.

The pieces of lead thus formed are, when placed together in a cylindrical figure, to be enveloped with paper, and the case containing the powder is to be placed behind them. A small recess is made in the outer end of the cylinder of combined shots for the reception of a detonating cap, which, when introduced therein, is to be covered by a disc of thin paper for the purpose of securing it.

In loading the blunderbuss with this cartridge, the end having the detonating cap is first pressed into the nipple, and the thin disc of paper giving way, this pressure causes the cap to attach itself to the nipple. The cartridge is then introduced into the false breech, and which, being fixed in its position, as described above, is then ready to be fired.—[*Inrolled in the Petty Bag Office, January, 1832.*]

To John Pearse, *of Tavistock, in the county of Devon, ironmonger, for his having invented certain improvements on wheeled carriages, and on apparatus to be used therewith.*—[Sealed 7th June, 1831.]

On reading the above title, any one would suppose that the Patentee's invention consisted in some improvement in the construction of a vehicle for travelling; but so far from that is the invention described, that not even the word carriages is once mentioned throughout the specification, the whole of the invention consisting in the peculiar construction of the wheel, and what the Patentee calls an improved felloe, see Plate IV., fig. 6.

The felloe, or rim of the wheel, is formed by a strong iron ring *a*, which has holes perforated through it for the reception of the outer ends of the spokes *b*, *b*, the inner ends of the spokes being confined in the box or nave by screw nuts *c*, *c*. The spokes are placed diagonally; but the holes in the felloe, into which they are inserted, are made straight, and extending to the centre; and the outer ends of the spokes are confined by a tire *d*, which embraces the felloe, and is attached thereto by screws. The particular advantage of this mode of connecting the spokes to the felloe is not pointed out by the Patentee.

The improvement in the nave or box of the wheel is described as consisting in its being constructed partly of wood and partly of iron. The wooden parts are shown at *e*, *e*; the metal parts at *f*, *f*, are two cylindrical collars, connected together by longitudinal strap pieces, forming recesses as receptacles for the oil at *g*, which is introduced through an aperture *h*, closed by a screw. The parts constituting the box of wood and metal are kept together by two end plates, which are confined by bolts *i*, *i*, making the whole secure and tight.

The Patentee states, in conclusion, that he does not claim as his invention, the spoke which is formed of iron rods; but he does claim the manner of connecting the spokes to the felloe of the wheel, and also the peculiar construction of the nave of the wheel, partly of wood and partly of metal, as described.—[*Inrolled in the Inrolment Office, December*, 1831.]

[See the specification of Jones's iron wheels, Patented 11th October, 1826, "London Journal," Second Series, vol. i. p. 154.—Ed.]

To John Dyer, *of Mark-lane, in the city of London, merchant, in consequence of a communication made to him by a foreigner residing abroad, for an improvement in the material, used for fining or clarifying liquids.*—[Sealed 22nd October, 1835.]

The subject of this patent is the production of a material which, when mixed with wine, beer, and some other spirituous and fermented liquors, shall act chemically upon those liquors, for the purpose of dispelling or precipitating such matters held in solution as may have caused the liquors to become turbid.

The material proposed is principally a compound of albumen, carbon, and lime. White of egg and animal blood are suggested as the most convenient matters from whence the purifying materials may be obtained, which are to be evaporated to dryness, and then pulverised.

These matters may be dried either in an open or close vessel, but a close retort is preferred; and a sand or water bath of 110 deg. Fahr. is proposed as the vacating medium.

Beside white of eggs and blood, bones may be employed, which should be from young animals, and when perfectly dry are to be pulverised. Clay, or other similar earthy substance may be used, and also pulverised animal charcoal.

The powders thus produced, may be combined in the proportions of three parts of white of egg to one of blood. About the measure of a cubic inch of this compound, mixed with a small quantity of water, is to be introduced into a pipe of red port wine and stirred up with it, and after a short time the wine will become fine and bright.

A compound of three parts blood, one part bones, and one part yellow marl; or of two parts blood, two parts animal charcoal, and one part bone, all reduced to a fine powder, and mixed with water, may be applied in a similar way to purify white wines, cider, beer, and other liquors.

The Patentee says, in conclusion, he is aware that blood has been used, and also animal charcoal, for clarifying saccharine liquor; he, therefore, does not claim those, unless combined with the other substances; but that which he particularly claims, is "producing the whites of eggs in the state of powder, and compounding them as above described."—[*Inrolled in the Inrolment Office, April*, 1836.]

To Henry Pollard, *of Park-street, Grosvenor-square, in the county of Middlesex, estate and house agent, for his invention of a mechanical apparatus as smoke conductor.*—[Sealed 19th October, 1831.]

This mechanical apparatus is a cowl or moveable cap for a chimney pot. Its form does not materially differ from the cowls in common use; but instead of the vane usually placed at top of a cowl for the purpose of turning its discharging aperture into a position opposite to the wind, the Patentee has mounted a small rotary flyer, having oblique wings, as the flyer of a smoke jack.

This flyer revolves in a vertical direction, its horizontal axle turning in bearings fixed to the top of the cowl, the object being the same; and the mechanical apparatus very nearly resembling the mechanism of the ordinary pilot flyer of a windmill, by which the arms of the mill are, as the wind shifts, constantly brought into the most favourable position.

The construction of this improved cowl, and the mechanism by which it is worked, are very imperfectly represented and described in the specification, but the general object may be readily understood. At the end of the axle of the rotary flyer there is a pinion, taking into some train of wheel-work, which is connected with a horizontal rim of teeth upon the edge of the base or stationary part of the cowl; and the upper part of the cowl being suspended upon a vertical spindle, and capable of revolving, is thus made to turn round in accordance with the varying directions of the wind by the rotary action of the flyer, communicated through its wheel-work to the stationary rim of teeth. Thus, the discharging aperture of the cowl is invariably kept in such a position as shall allow the smoke to escape freely from the chimney.—[*Inrolled in the Petty Bag Office, December*, 1831.]

To CHARLES MEPHAM HANNINGTON, *of Nelson-square, in the county of Surrey, gentleman, for his invention of an improved apparatus for impressing, stamping, or printing, for certain purposes.*—[Sealed 22nd January, 1831.]

THIS appears to be simply a counting machine attached to a stamping press, for the purpose of registering the number of impressions taken in the press, and of printing or stamping them upon the article operated upon by means of self-moving types or dies.

The particular object of thus printing or stamping is not pointed out, but we presume it is designed for producing series of tickets or labels, the numbers of which are to run in arithmetical progression, or it may apply, under suitable modifications, to the numbering of bank notes.

The mechanism does not appear to possess any particular features of novelty; it is a series of wheels combined and actuated in the same sort of way as other counting wheels. Upon the rims of the wheels the numerical figures are cut, as types or dies; and the wheels being moved part of a rotation by a lever and click, by every stroke of the press, the numbers are successively brought up, and made to stamp the matter submitted to operation. —[*Inrolled in the Inrolment Office, July*, 1831.]

To JOHN POTTER *and* JAMES POTTER, *of Spiedly, near Manchester, in the county-palatine of Lancaster, spinners and manufacturers, for their invention of certain improvements in machinery, or apparatus applicable to the spinning or twisting of cotton, flax, silk, wool, and other fibrous materials.*—[Sealed 21st March, 1831.]

This improvement applies to the throstle frame, and consists, first, of a mode of guiding the fibrous materials from the drawing rollers to the bobbins by means of a cone, instead of the ordinary flyer; and, secondly, in a mode of tempering the drag for effecting the winding of the yarn upon the bobbin.

Plate IV., fig. 5, represents a portion of a throstle frame with two of its spindles *a, a*, each having a bobbin *b*, fixed upon its top. These are denominated dead spindles, because they are not driven round by a band and warve, as in ordinary throstles; neither are they fixed spindles, as in some of the construction of throstles, but they bear upon steps at bottom, and are allowed to turn, if drawn by the tension of the yarn in winding upon the bobbin.

The novel apparatus is the trumpets *c, c*, one of which is shown in section in the figure. These trumpets, as they are denominated, are mounted in bearings in the rails *d*, *d*, immediately over the spindles, and are made to revolve by bands from a drum, the bands being passed round the warves *e*, *e*.

The trumpet is formed internally as a straight tube for some distance down; and toward the lower part is widened out into a frustrum of a cone. The roving of cotton or other fibrous material to be spun is passed from the front drawing rollers through the tube; and after proceeding some distance down the interior of the cone, is passed through a hole in its side, and under the edge of the cone to the dead bobbin, upon which it winds.

The trumpets being put in rapid rotary motion, cause the fibres of the cotton, or other roving passed through them, to be twisted, that is, spun into yarn; and the drag of the dead spindle causes the yarn to be wound upon the bobbin; the rising and falling of the bobbins to produce the regular form of the cops, being effected by what is called a copping movement of the spindles.

In order to increase the drag, and cause the bobbins to take up, or wind on, the spun yarn more rapidly, a double strap *f*, is placed in contact with the spindles, so as to produce friction. This strap is attached at one end to a spring rod *g*, and at the other end is drawn by a weighted cord *h*. According to the tension of the strap produced by the weight, so will be the friction upon the spindles, and consequently the drag of the bobbins.

All the other parts of the throstle frame are constructed and worked in the ordinary way; and the Patentee says, in conclusion, that his claim of invention consists, first, in the adaptation of the rotary trumpet tubes, which the cops or bobbins are to pass into without touching; and, secondly, the mode of giving any required degree of drag to the bobbins.

Notwithstanding the simple character of this improvement, the whole matter of which we have given above, and which, figuratively speaking, is in a nut-shell, the talented individual who has been employed to draw up this specification has, with unparalleled ingenuity, contrived to occupy nine skins of parchment with its details; and further to illustrate his literary production, with four sheets of drawings.—[*Inrolled in the Inrolment Office, July,* 1831.]

To LIGHTLY SIMPSON, *of Manchester, in the county-palatine of Lancaster, chemist, for his invention of an improvement in the preparation of certain colours to be used for printing cotton and other fabrics.*—[Sealed 10th December, 1835.]

THIS improvement, in preparing certain colours to be used for printing cotton and other fabrics, consists in the employment of a certain material never before so applied, as a mucilage for holding and thickening certain colours used in printing calicoes and other fabrics.

Many of the colours employed for these purposes require to be made up in a mucilaginous matter, in order to give that consistency to the colour which shall enable it to be put upon the fabric by means of engraved plates or cylinders, or by blocks in the way of printing ink.

For this purpose, it has been customary to form the mucilage of foreign gums of different kinds, such as gum arabic or Senegal, which are extremely expensive, and are now becoming scarce.

In order to meet the demand of the printing trade, and to diminish the cost of the printing process, the Patentee employs, in place of the gums heretofore used, a material of the fucus kind, found in abundance on the shores of Ireland, called or known as an article of commerce by the name of carrageen moss, and by botanists, "chondrus crispus," belonging to the order of *algo-inarticulated*, or sea-weeds without joints, and is capable of being dissolved into a mucilage by water and heat, after the manner of isinglass, and many kinds of gums.

In employing this material it is to be dissolved with hot water, in the same way as isinglass or gum arabic is usually dissolved, and afterwards strained, to remove any foulness or improper matter. Native gums, or other substances may be added in small quantities, should certain colours require it; and the proportions of the materials so mixed together, must be left to the judgment of the operator.

In using this material, the Patentee has found that by mixing half a pound of the carrageen moss with a gallon of water, heated to about 120 deg. Fahrenheit, and keeping it occasionally in agitation by stirring, after about forty-eight hours, the liquor will have become a thick mucilage, and be fit to be strained off for use. But as a considerable quantity of the moss will remain undissolved, a farther half gallon of water, of the same temperature as before, may be poured upon the remaining undissolved moss; and when strained off, this liquor will be found useful for thinning the first mucilage, when required.

This mucilage has been used for mixing and thickening various colours for calico printing, particularly buffs, drabs, and slate colours: and the Patentee claims the application and use of it under the right conferred by the before-mentioned Letters Patent, for the purpose of mixing, preparing and thickening colours for printing calicoes and other fabrics, the same having never been used by any other person, or persons, before him, within this kingdom, to the best of his knowledge and belief.—[*Inrolled in the Inrolment Office, June,* 1836.]

Specification drawn by Messrs. Newton and Berry.

To THOMAS ROBINSON WILLIAMS, *late of Norfolk-street, Strand, in the county of Middlesex, but now of* 14, *Lamb's-buildings, Bunhill-row, in the said county, Esq., for a new combination of fibrous materials forming, by means of machinery, artificial skins, which may be applied to the purposes for which skins, leather, vellum, and parchment are now used.*—[Sealed 14th February, 1833.]

THIS invention is described as consisting in "a new combination of fibrous materials, forming artificial skins, by means of machinery." The Patentee says, he suspends fibrous materials in air instead of water; and he draws, deposits, and lays, the same on woven or perforated sheets or forms of metal, wood, or cloth, by means of a partial exhaustion of the air under or on the opposite side of the same; and he dips or saturates the so laid fibrous materials in adhesive combinations, whereby he completes his new combination.

He says, "I make use of some machinery well known, and I likewise use combinations of machinery consisting of parts and modifications of machines now first combined and connected together, which have not been, as I verily believe, so combined or connected heretofore.

"It may," says the Patentee, "render the subject of this invention more clearly understood by observing that my new combination of fibrous materials is in contradistinction to the present mode of reducing fibrous materials into a state of pulp suspended in water, as in the manufacture of paper; also to the process of spinning and weaving, as in woven fabrics; and also to that of felting, as furs, wools, hairs, and other substances are felted together."

Plate III., fig. 5: A, represents a carding engine, on the feeding end of which B, is to be placed, the fibrous material, whether silk, cotton, flax, hemp, wool, fur, or hair alone, a mixture, or any of them, previously cleansed and opened by machinery in common use, as picker, devil or willie. Each material may be used separately, as silk or cotton; at other times half of each, or one-third silk and two-thirds cotton: conducting the operations in using or mixing those, or any of the other material, according to the work proposed.

When passed through the carding engine, the fibres are deposited upon the doffer or last card cylinder C. The usual mode of taking off materials from the doffer of a carding engine, is by means of a comb and apparatus called a comb crank, which delivers them in a thin sliver or tissue; but the fibres, in that case, are too much in a longitudinal direction with the sliver to suit the present purpose; the Patentee, therefore, makes use of a fan at D, covered on the top, and revolved with considerable velocity by a strap. This fan blows the material, finely opened, from the doffer into the air, from which suspended state it is drawn down, laid, and deposited upon an endless revolving apron or band *z*, *z*, of woven metallic wire, or cloth, or other perforated substance, or of wooden or metallic rails or rods, extended round the two rollers *a*, *b*; and in order to lay the material equally upon the apron, and to make a continuous batt, fleece, or sheet, a partial exhaustion of the air is produced in the box E, which is open on the top, and fitted with side feeders or wings between the apron.

This partial exhaustion of the air may be produced at some distance from the machine if required, provided it be connected with the box E, by covered troughs or pipes, by any of the usual methods of exhausting; but it is here represented as generally produced by means of a fan F, fixed under the floor upon which the carding engine stands, the fan being moved with the required velocity to produce a sufficient exhaustion, the air being expelled from the box F, through openings in its sides.

The batt thus formed upon the endless apron moves onwards until it reaches and is received into an adhesive composition contained in a dipping box or cistern G, between the large roller H, and a series of smaller ones below it; thence it passes up between the two rollers H, and I, which may be adjusted to any required thickness of the batt by means of a lever and weights acting upon the plummer blocks of the roller I.

The best adhesive composition which the Patentee knows of, consists of four or five parts of strong glue, carefully soaked in cold water, to one or two parts of flour or starch, made into a thin paste, in cold water, mixed together and put into the cistern G, and gradually heated up to the boiling point by means of steam, which may be introduced either through a pipe coiled round the inside of the cistern, or a double bottom thereto: the heat may be obtained by direct fire; but steam is preferable in all respects.

The adhesive composition may be varied; but after many experiments with glue, flour, starch, and also with gums that soften by heat and water, the Patentee has found the above-mentioned composition best for general use.

The batt of fibrous material now passed through and saturated in the cistern, is continued by a web *d*, *d*, *d*, over the drying machine in common use, of which L, M, N, are three hollow metallic cylinders heated through steam pipes *e*, *e*, *e*, and stuffing boxes at their axles.

Another mode of operating is shown at fig. 6. A, also represents a carding engine; B, the feeding cloth; C, the doffer, and the material flowing from it by the operation of the fan F, put in rapid rotary motion; D, is the exhausting fan below; E, the exhausting box, which is here made to revolve upon its centre at the bottom by means of a large circular rim G, through which the air is drawn.

On the top of this box E, there are other lesser openings, upon which are placed any required forms, as for example, *b*, *c*, set upon wheels, the centres of which are open for the air to pass through, but which are kept in their places by rims on their under sides, similar to that at bottom of the exhausting box; they receive a slow revolving motion from an upright spindle *d*, and pinion *e*, placed exactly over the centre of the box E.

A sufficient quantity of the fibrous material having been deposited on one form, another, made in two halves, as shown detached at fig. 7, is placed over the material and inner form, and the whole removed together and dipped into the adhesive composition before described, which saturates it. The material thus combined is taken from the forms and dried. The forms may be made of any perforated substance of sufficient strength, but copper or zinc is preferred.

Another method of applying the same principle is shown at fig. 8, which represents the ordinary picker, having, however, a greater number of spiked teeth on the circumference of the cylinder, but without what are called opposition teeth. The fibrous material is placed upon the feed apron B, and when opened by the rapid volution of the teeth on the cylinder, it is deposited upon the endless revolving apron E, and thence passes on to the compressing rollers 1, 2, 3, 4, 5, 6, 7, the upper of which are weighted upon the lower; from these it is conducted into and through the cistern F, precisely as represented, in the first instance, in reference to fig. 5.

The adhesive composition used in this process is generally similar with that mentioned in the first instance, except that a little pitch or rosin is sometimes added, which may be easily melted with the composition, if it do not contain too much water.

For some purposes where the artificial skin is required to be formed of a fine texture, or of considerable thickness and strength, and to be submitted to pressure, or to be stamped into various forms and irregular figures, the manner of proceeding is as follows:—Having formed the requisite batt, fleece, or sheet, out of the fibrous material, by means of the machinery described under the first processes, it is to be placed between frames of woven wire, or perforated sheet of metal, wood, wicker-work, or cloth, for support, and to prevent its derangement; then dip or saturate the same in the adhesive composition, and when sufficiently dried or cooled, submit it to the necessary pressure, or to the stamping by dies into the forms required. The Patentee says, "For other purposes, I find it convenient to spread evenly over on one side of two sheets of the thinner article, formed by the means detailed in the first process, the adhesive composition, which soon dries sufficiently to prevent its running; between these two sheets, I place a batt formed of the fibrous material of any required thickness, by means of the machinery described under the first or third processes, as may be most suitable and convenient, the prepared or glutinous sides of the thinner material being next the upper and under sides of the said batt. The whole thus laid is placed between heated dies or forms, and submitted to powerful pressure, thus at the same time softening the adhesive composition, and forcing it through the batt, which receives, and when cold retains the forms and shapes of the dies. In applying the artificial skins combined according to the first and third processes, for the purposes of smoothing and polishing, as fish skins are now used, I scatter upon the sheets, whether thick or thin, immediately after they are dipped into the adhesive composition, either emery sand or powdered glass, and which when dry become completely incorporated and united with the skin.

"I should here observe, in addition to the foregoing descriptions, that I consider the processes detailed under the first and third heads, as those most explanatory of my new manner of combining fibrous materials, forming, by means of the machinery therein described, the artificial skins; for example, the first the finer, and the third, such as are required to be of a thicker and stronger texture; and that the second, fourth, and fifth processes are generally more descriptive of the manner in which, whether formed of a fine texture, or of considerable thickness and strength, they may be submitted to pressure, or stamped by means of dies, so that they shall receive and retain the figures, shapes, or forms, thereby impressed into or upon them."—[*Inrolled in the Rolls Chapel Office, August,* 1833.]

Specification drawn by the Patentee.

To JOHN RAMSBOTTOM, *of Todmorden, in the county-palatine of Lancaster, mechanist, for his invention of certain improvements in machinery for roving, spinning, and doubling cotton, and other fibrous substances.*—[Sealed 6th January, 1836.]

THESE improvements in machinery for roving, spinning, and doubling cotton, and other fibrous substances, consists in a new arrangement and construction of the parts constituting a spindle and flyer, to be used in the ordinary throstle frame, or other spinning machinery, chiefly designed for the purpose of spinning in those machines, instead of mules, as is the usual practice, either upon a bobbin or quill, or upon the bare spindle, without the use of the bobbin or quill, which has hitherto been employed in throstle frames. In addition to the novel construction and arrangement of the parts of the spindle and flyer, the Patentee has applied a self-acting friction surface for retarding and regulating the flyer in accordance with the varying diameters of the cop; the ordinary evolutions of the machine being the medium of varying the drag, and accommodating it to the required tension of the yarn.

In Plate IV., fig. 1, is an elevation of the improved spindle and flyer complete, having the cop shown in section. Fig. 2, is a similar view of the spindle, with its flyer turned round one-fourth of a revolution, so that its side or broader surface is presented to view; and fig. 3, is a representation of the spindle and flyer in the same situation: but the upper part of the flyer is, in this instance, disengaged from the spindle and placed in an inclined position, in order that the full cop, or bobbin, may be doffed, or drawn off the spindle; and when that is done, the flyer must be restored again to its upright position, as shown in figs. 1, and 2, previously to the commencement of the formation of another cop.

In these three figures, the respective letters of reference indicate the same parts of the apparatus. *a*, *a*, *a*, is the spindle intended to be supported upon a step rail in the ordinary manner: *b*, *b*, is the flyer, which, it will be perceived, is composed of two parts, connected together by sliding joints. The upper portion of the flyer has a central pin or pivot *c*, revolving in a cup or recess formed in the top of the spindle by which it is supported.

This upper portion of the flyer has grooves or long slots *d*, *d*, in its sides, in which guide pins or studs, fixed in the arms of the lower portion of the flyer, slide as the copping rail *e*, *e*, and the lower portion of the flyer ascends and descends.

The upper portion of the flyer, which acts merely as a guide, is attached at its lower ends by joint pins to a disc or plate *f*, through which the spindle passes. These joint pins are for the purpose of allowing the upper part of the flyer to be thrown off from the spindle, as shown at fig. 3.

The lower ends of the arms of the flyer are also attached to a cone or disc *g*, through which the spindle likewise passes; and by means of these joints he arms of the flyer are enabled to fall into the inclined position shown in fig. 3, when the bobbin or cop is to be doffed. The upper parts of the arms of the flyer are connected by a slight ring, for the purpose of preventing the arms from expanding by the centrifugal force when revolving with very great velocity. The warve *h*, at the lower part of the spindle, is formed with a conical top, in order that the band may be easily removed, when required to stop any particular spindle, without suspending the action of the whole frame; and it will be clearly perceived, that by a very slight pressure on the band, it will travel toward the base of the cone, and readily re-place itself in the roll or groove of the warve.

Attached to fig. 2, there is shown partly in section, an apparatus carrying a longitudinal bar, rod, or rail *i*, which is intended to bear against the under surface of the cone or disc *g*, at the bottom of the flyer, for the purpose of producing friction, and retarding the rotary movement of the flyer, for effecting the taking up or winding of the spun yarn on the cop or bobbin. A shaft *k*, extending the whole length of the throstle frame, is attached to the copping rail *e*, *e*, at convenient distances, by brackets. To this shaft *k*, bent arms *l*, are affixed in suitable situations for supporting the friction bar, rail, or rod *i*. This bar, rail, or rod, may be of wood or metal, and if required, in order to increase the friction, it may be covered with flannel or other material. From the shaft *k*, an arm *m*, extends behind; the extremity of which arm is formed with an acute edge, taking into the ratchet on the edge of a pendant lever *n*. This lever hangs upon a stud, set in the end frame or standard of the machine, and is weighted in order that the ratchet teeth may always bear against the end of the arm *m*.

It will be perceived that as the copping rail *e*, rises, the friction bar, rail, or rod *i*, will be carried up also, and that in so rising the edge of the rail, bar, or rod, will be moved inward and made to bear against the smaller circumference of the surface of the cone *g*, at the bottom of the flyer, as shown by dots in fig. 2. At this time, the friction exerted upon the flyer will necessarily be less than when the edge of the bar bears against the larger circumference of the cone, and which variation of the friction is required for the purpose of varying the force of the drag in accordance with the diameter of the cop or bobbin, for the purpose of equalising the tension of the yarn.

In order to keep the rail, bar, or rod *i*, in the same relative positions with regard to the spindle at all times as the cop or bobbin fills upward, the end of the arm *m*, must be lifted from tooth to tooth in the ratchet *n*. This is done by means of a stop *o*, attached to the back of the copping rail, which has an adjusting screw *p*, for the under part of the arm *m*, to strike upon. As the copping rail *e*, rises, the arm *m*, assumes the inclined position shown by dots in fig. 2, and coming upon the end of the screw *p*, is there stopped; and consequently, the arm there is made to rise with the copping rail, and is thus lifted a tooth in the ratchet occasionally as the cop is building up or filling.

Fig. 4, shows a modification of the contrivance in which a quill or bobbin *q*, *q*, is placed upon the spindle, so that in the event of the yarn breaking, the bobbin may be stopped, without throwing off the band from the warve.

In conclusion, the Patentee says, "Having now described my improvements in machinery for spinning and doubling cotton and other fibrous substances, I desire it to be understood that I claim under the above recited Letters Patent, first, the construction of a spindle and flyer, as shown in the drawing; and, secondly, the adaptation of a moveable friction bar, rail, or rod, acting against the under surface of a disc or cone, for the purpose of tempering or varying the drag of the yarn as it winds upon the bobbin or upon the naked spindle."—[*Inrolled in the Rolls Chapel Office, July*, 1836.]

Specification drawn by Messrs. Newton and Berry.

To JOHN WILDE, *late of New York, in the United States of America, but now residing in Manchester, in the county-palatine of Lancaster, merchant, and* JOSEPH WHITWORTH, *of the latter place, engineers, for certain machinery for effecting the operation called knitting, and producing a fabric similar to that of knitted stockings, being partly a communication from a foreigner residing abroad.*—[Sealed 10th November, 1835.]

THIS invention is a certain combination of mechanism for manufacturing stockings and other articles fabricated from cotton, worsted, silk, and other fibrous materials, in what is commonly called or known as the *knitting stitch*; the operations of the mechanism being designed to produce distinct loops or stitches upon short needles or points, resembling the knitted fabric made by knitting needles when worked by hand.

In Plate V., fig. 1, is a front elevation of the complete machine, the same letters denoting similar parts. Fig. 2, is a plan or horizontal view of the same; some of the upper portions of the machine being removed to exhibit the lower parts more perfectly. Fig. 3, is an end view of the machine; some of the parts being cut through transversely and shown in section. A, A, is a sliding rail or bar, moving longitudinally to and fro in front upon rollers B, B, B, which turn on fixed studs, extending from the base plate C, C. The rail or bar A, carries a row of needles or points *a*, *a*, *a*, upon or round which, severally, the thread or yarn is to be looped to form the stitches. As a matter of convenience, we set these needles or points in leads, and attach them to the front of the sliding bar or rail by screws, as at *b*, *b*, *b*, much in the same way as points or needles are mounted in lace machines, and in ordinary stocking frames. One of these leads, with the needles or points *a, a, a,* is represented detached in three positions at fig. 4, for the purpose of showing the forms of the needles or points more perfectly.

A horizontal rotary shaft D, D, turning in plummer blocks on bearings E, E, fixed to the base plate, is the main driving shaft of the machine. Upon this shaft there is a loose driving pulley F, turned by a band or cord from any first mover; which pulley, in order to put the machine in action, must be locked to the shaft by the clutch G. This shaft D, carries the several cams by which the operating parts of the mechanism are actuated.

The shaft D, with its cams, is represented detached from the machine at fig. 5, for the purpose of showing the forms and positions of the cams more clearly than they can be seen in any of the other figures; and these cams are severally represented detached from the shaft, in figs. 6, 7, 8, and 9.

A standard H, H, H, fixed at the hinder part of the base plate, is bent forward at top, principally for the purpose of carrying the axle of the lever I, which conducts the thread or yarn to be worked upon the points or needles *a, a, a,* in front. This standard also carries the levers L, and M, by means of which the stitches are connected: that is, the manipulations of the knitting are performed.

A bobbin K, containing the yarn or thread from which the knitted fabric is to be produced, is mounted, and turns loosely upon an axle, or on pivots, in a frame or bracket at the back of the standard H, and from this bobbin the yarn or thread *c, c, c,* is conducted over the bent part of the standard between guide rollers *d, d,* over a pulley *e*, and thence through a hole in the lower part of the guide arm of the lever I, to the eye or guide at the extremity of that lever, which we denominate the feeding lever, because by it the thread or yarn is conducted and looped round the points *a, a, a.* This lever is attached to an axle mounted in the front part of the bent standard H, and is shown detached and in different positions at fig. 10, with its tail J, on which a rotary cam operates to work the lever, and effect the feeding of the yarn or thread. The lever L, having a small arm *f*, extending at a right angle from its side called the pressing lever, is shown detached in several positions at fig. 11. This lever is mounted upon a swivel joint at *g*, in the upright part of the standard H, and is employed for holding down and tightening the yarn or thread while it is conducted or looped round the needle.

The lever M, which carries, at its extremity, a tumbling piece *h*, having a hook *i*, is called the lifting lever, because its hook lifts successively each loop (formed by a previous course of operations) from the lower part of the stem of each needle *a*, and passes it over the loop subsequently made, and over the point of the needle, for the purpose of securing the loop just formed upon the needles, and so perfecting the stitch. This lever has its fulcrum in an axle or pin at *j*, in the standard H, and is shown detached at fig. 12.

The cam N, upon the rotary shaft D, (shown detached at fig. 6,) acts against the tail lever J, affixed to the shaft of the feeding lever I, and, as it revolves, causes the lever I, with the guide arm, to move inwards into the position shown by dots in fig. 3; but the lever I, is forced outward again by a spring O, which depresses the tail lever, as soon as the cam N, has passed away from it.

The cam wheel P, (shown detached at fig. 7,) has a thin edge or rim *x*, acting in the teeth or notches at the back part of the sliding rail or needle bar A, (see fig. 2.) A portion of this rim *x*, is moveable at *x**, upon a hinge joint, and which portion, by being drawn obliquely on one side, causes the rim, as it revolves, to act as a lateral cam or endless screw, taking into the next notch in succession of the rack at every rotation, and, by that means, sliding the rail or bar A, with the points *a, a, a,* laterally upon the rollers B, B, B.

Two stop pieces Q, Q, are employed for changing the lateral movements of the bar A; these are mounted on adjustable plates R, R, which may be slidden along the bar A, and placed at any distance apart, in order to determine the breadth of the work, or the extent to which the knitting shall be carried on the row of needles *a, a, a.* On each of the plates R, an arm S, is mounted as a lever upon a joint in a standard fixed upon the plate; and when the plates are adjusted, that is, slidden into the desired situations, the arms S, are let down into horizontal positions, between the points *a, a, a, a,* as shown, and there remain stationary. The means by which the stops effect the changing of the lateral movements of the rail or bar A, will be explained hereafter.

The cam T, (represented detached at fig. 8,) as the shaft D, revolves, raises the lever M, to effect the lifting and turning over of the loop by the hook *i*; and when this is done, the lever is drawn down again by the force of a helical spring.

The cam U, (shown detached at fig. 9,) is intended, as it revolves, to raise the pressing lever L; that lever being drawn down by a helical spring also. The arm *f*, extending from the end of this lever when depressed, holds down the thread or yarn tight, while the feeder is forming a loop upon one of the needles *a*. A small anti-friction roller, mounted in a fork at the under side of the lever *l*, runs upon the periphery of the cam U, and a bent part of the cam, seen at *y*, causes the lever to be suddenly shifted sideways at a certain part of the operation, for the purpose of drawing the pressing arm *f*, from the loop when the stitch has been completed, and bringing it into a proper position for pressing down and holding the yarn or thread, while the loop is formed round the next needle.

The several parts of the machine having been now described, we proceed to explain its mode of operating: to produce the fabric, a course of loops of yarn or thread being first put upon the series of needles *a*, *a*, *a*, of a similar kind to the loops put upon ordinary knitting needles in commencing to knit.

The shaft D, being put in rotary motion by means of a driving band passed round the pulley F, (when the pulley is locked thereto by the clutch G, as before described), that rotary motion causes the several cams to move the several levers, and to traverse the needle bar A, as explained; and the yarn or thread *c*, *c*, *c*, is fed in by drawing from the loose bobbin K, between the rollers *d*, *d*, over the pulley *e*, and through the eyes of the feeding lever L, merely by the tension it requires in being looped upon the needles.

The cam N, thus revolving moves the lever L, in and out as shown by dots in fig. 3, for the purpose of causing the guide at its end to carry the thread or yarn between the needles *a*; at the same time the rim *x*, *x*, and *x**, of the cam wheel P, acting as a spiral tooth in the rack at the back of the bar A, in performing one rotation moves that bar with the row of needles laterally, a distance equal to one of the spaces at which the needles are placed apart; consequently, the guide at the end of the lever L, in proceeding inwards, conducts the thread or yarn on one side of the needle *a*, and, in returning, leads it on the opposite side of the same needle; thereby looping the thread or yarn round the upper part of the shaft of the needle, above the loop previously formed thereon. This being done, the lever M, governed by the cam T, is now allowed to fall into the situation shown by dots in fig. 3, and in falling its tumbler *h*, is thrown back by a pin on its side, striking against a piece 1, attached to a perpendicular plate V, affixed to the bent part of the standard H above: spring guide 2, prevents the tumbler from falling too far back. The tumbler *h*, being by these means thrown into the position, shown by dots, the point of the hook *i*, is made to pass down a groove in the back of the needle, and having descended below, the lower loop of thread or yarn, previously formed upon the stem of the needle, as described, or by the preceding course of the machine, on the lever again rising, the point of the hook will take hold of the lower loop, and lift it up the stem of the needle which is also assisted by the rising of the presser *f*. As the lever rises, the pin on the side of the tumbler is, by the tension of the loop upon the hook, brought against the curved guide piece 3, fixed to the plate V, which causes the hook to turn the lower loop over the point of the needle, thereby securing the upper loop upon the needle, and finishing the stitch. A lateral movement of the lever L, now takes place, for the purpose of withdrawing the presser *f*, sideways from the stitch, which is effected by the bent part of the cam U, at *y*, as it revolves acting against the side of the fork, under the lever L; the lever turns horizontally, a little distance upon its swivel joint at *g*, and is then returned to its former place, ready to assist in forming the next stitch.

Repetitions of these evolutions of the levers form and connect the successive stitches, consecutively, upon the range of needles *a*, *a*, *a*; and when the series is complete, the bar A, is made to slide in the opposite direction, for the purpose of connecting another series of stitches with the former, by similar means; which operations go on until the required piece of knitted fabric is completely made.

We now proceed to describe the means by which the bar A, carrying the needles *a*, *a*, *a*, is made to change the direction of its lateral movement; this is effected through the agency of the jointed part of the rim *x*, of the cam wheel P. When the piece *x**, stands in the oblique position, shown in figs. 2, and 5, the rotation of the cam wheel P, will cause the oblique part of the rim acting in the rack at the back of the needle bar A, to drive that bar towards the left hand; but when the position of the piece *x**, is changed to the opposite angle, as shown by dots in these figures, then the needle bar will be moved toward the right hand.

In order to effect these changes of position in the piece *x**, the following means is adopted:— A small spring catch, shown detached at fig. 13, is affixed within the cylindrical part of the cam wheel P, as shown by dots in figs. 2, and 5. This spring catch has two notches, separated by a ridge or double inclined plane; into one of these notches the outer or moveable end of the jointed portion *x**, of the rim of the cam wheel P, is to be inserted, for the purpose of being held firmly at an oblique angle to the other part of the rim. On applying lateral force to the piece *x**, it will move upon its hinge, and the spring giving way it will be readily shifted from one notch to the other. By these means the piece *x**, is made to stand in either of the oblique positions, for the purpose, when revolving, of conducting the bar A, toward the right or toward the left.

The shifting of the piece *x**, is effected by the small disc *z*, mounted on a pivot in the periphery of the cam wheel P. This disc *z*, has a notch or recess in its edge, into which the moveable end of the piece *x**, is inserted; and there are ears extending from the disc, for the purpose of moving it upon its pivot. The stops Q, Q, being, as before explained, fixed at those parts of the needle bar A, where the knitting is to terminate, the lateral movements of the bar will, at the extremity of each course, bring one of those stops up to the side of the rim *x*; and when this period of the operation arrives, one of the ears of the disc *z*, will, as the cam wheel revolves, strike against the stop Q, and cause the disc to be turned round, so as to throw the piece *x**, into the opposite oblique position, when the needle bar A, will immediately be made to travel in the reverse direction.

It will be perceived on reference to figs. 1, and 10, that the feeding arm of the lever I, stands a little out of the perpendicular; this is for the purpose of causing the eye which conducts and loops the thread or yarn upon the needles to be in advance of the hook *i*, which turns the stitch over the point of the needle. When, therefore, the travelling movement of the bar A, is reversed, the inclination of the feeder must be changed also, in order that by standing at an opposite inclination it may be still in advance of the hook.

For the purpose of effecting this, the feeding arm is attached to a square upon the axle of the lever I, by a screw 4, at top (see fig. 10), and turns upon that screw as a pivot. At the back of this arm there is a spring piece 5, standing at a right angle to the axle, the upper end of which is firmly fixed to the square of the axle but the lower end has a tooth, which, by the pressure of the spring, is forced into one of the two notches in the back of the feeding arm; by these means the feeding arm is made always to stand slightly inclined from the perpendicular. A piece 6, 6, is attached to the lower part of the feeding arm extending on each side; and when the bar A, has travelled so far as to bring the stop Q, nearly up to the side of the rim *x*, one of the arms s, extending from the stop plate, comes in contact with one of the ends of the piece 6, and pushes it and the feeding arm over into the opposite angle of inclination.

The various evolutions of the machine for producing the fabric having now been explained, I proceed to point out the means by which its movements are suspended when it is requisite to shift the stops s, s, and narrow the width of the fabric formed upon the needles, as in shaping the calf and the narrow parts of a stocking.

It has been before said that the mechanism is put in action by locking the driving pulley F, to the shaft D, by means of the sliding clutch G; consequently, when the clutch G, is withdrawn from the pulley, the movements of the mechanism must necessarily be suspended. This is done by means of a pin or stud fixed into the face of a disc wheel W, the stud having an inclined plane at its end, which, as the wheel revolves, comes in contact with the clutch lever X, and pushes it aside. This lever turns upon a fulcrum pin Y, fixed in a standard upon the base plate C; and is connected to the clutch-box, as shown at fig. 2; and, therefore, when the pin or stud Z, comes against the side of the lever X, the clutch G, is withdrawn from the driving pulley F, and the movements of mechanism become suspended, in order that the attendant may shift the stops S, S, to the required positions. The mechanism may be again put in action by removing the stud which was last acted, from the wheel W, and again locking the clutch to the driving pulley. It will be seen, by reference to fig. 14, which represents in elevation the gear for driving the disc wheel W, taken transversely across the machine and partly in section, that there are several studs inserted into a segmental series of holes in the face of the disc wheel; these holes are for the reception of any required number of studs Z, in order that studs may be placed in different parts of the wheel, according to the required variable breadths of the fabric.

The construction and position of the several wheels and pinions employed for driving the stud wheel W, will be perceived by figs. 2, and 14; and it will be unnecessary to describe very particularly this gear, as it is only to be understood that a tooth a, introduced into the cam shaft D, drives the wheel b, one tooth at every rotation of the shaft; it will then be seen that the wheel c, upon the shaft of b, by taking into the wheel d, causes an endless screw e, to drive another wheel f, standing transversely, and principally shown by dots, upon the shaft of which last-mentioned wheel there is an endless screw g, taking into the wheel h, on the shaft of the disc or stud wheel W. Hence a certain number of rotations of the cam shaft D, will bring any one of the studs Z, into contact with the lever X, and throw the mechanism out of gear, as described; and that the several studs will act in succession, and stop the machine whenever the fabric is required to be narrowed. It will, of course, be understood that the diameters of the wheels and pinions here shown, are susceptible of variation, and that trains of different speeds must be employed according to the extent of the article of fabric to be produced; observing that the disc wheel is intended to make one complete revolution, and no more, from the commencement to the conclusion of the operation of producing any certain article.—[*Inrolled in the Rolls Chapel Office, May,* 1836.]

Specification drawn by Messrs. Newton and Berry.

To William Patterson, *of Dublin, gentleman, for his invention of an improvement in converting hides and skins into leather by the application of matter obtained from a material not hitherto used for that purpose.*—[Sealed 22nd October, 1835.]

This improvement consists in the employment of the wood of the blackberry bush as a tanning material, in place of oak bark.

The branches, stems, and roots of the blackberry bush, gathered in the spring, are to be dried by the sun, or by artificial heat, and are then to be broken up and ground in an ordinary bark mill, in a similar manner to that pursued in preparing oak bark for tanning.

The pulverised or broken material, thus prepared, is then to be macerated with water, and the tanning matter extracted therefrom, either by infusion or decoction. The proper strength of the liquor, when prepared, may be known by any competent tanner by its appearance and taste, as the strength of the liquor of oak bark is known; and it is to be used in a similar way in the process of tanning, or converting hides and skins into leather.

According to the kind of leather to be produced, so are the skins to be prepared and treated exactly as if oak bark had been used for obtaining the tanning matter.

The Patentee considers that this description of his invention will be fully sufficient to enable any competent tanner to use it with full effect in producing any particular kind of leather which he may desire; and he observes, that it is to be understood he lays no claim of invention to the processes employed for tanning the skins, but merely to the use of the branches, stems, and roots of the blackberry bush for obtaining a tanning matter.—[*Inrolled in the Inrolment Office, April,* 1836.]

To James Ward, *of Stratford-upon-Avon, in the county of Warwick, watch-maker, for his invention of improvements in apparatus for ventilating buildings and other places.*—[Sealed 12th August, 1834.]

The subject of this patent is a thermometrical apparatus, constructed as a modification of Dr. Ure's *Thermostat.* (See vol. viii. of our Second Series, page 307.) In that instance, the contrivance was a self-moving agent, the operations of which were produced by the expansion and contraction of two dissimilar metals, the apparatus being principally intended for adaptation to the distilling process, for the purpose of opening or closing the cock of a cold water pipe in accordance with any increase or diminution of heat, in order to keep the materials under operation at one uniform temperature. In the present instance, the apparatus consists of a simple metal rod, as a pyrometer, which, by expanding or contracting under any variations of atmospheric temperature, is intended to act upon a train of compound levers, in order to open or close a series of air apparatus by sliding a perforated plate or shutter formed as the register of an air stove.

Plate IV., fig. 7, represents the apparatus; *a*, is the metal rod, mounted in a wooden frame, to be affixed in any convenient situation in a building. The end of the rod *a*, projecting through the frame, acts against the compound levers *b*, which are connected to an arm *c*, on the axle of the circular plate *d*, *d*, *d*, which plate is perforated like the register plate of an air stove. The expansion of the rod *a*, causes the lever *b*, to move the arm *c*, and in so doing, to push round the sliding plate or register *d*, upon its centre; thereby opening the apertures, and allowing cold air to pass through for the purpose of effecting the ventilation.

A spring *e*, is attached to the moveable circular plate or register, in order to keep it in such a position as shall close the air passages; but when the heat is such as to expand the rod *a*, the spring gives way to the operation of the levers, and the plate being turned round, opens the air passes. In order to adjust the apparatus, a screw *f*, may be turned, which causes the bar *a*, to advance or recede.

The same contrivance of the expanding bar and compound levers may be adapted to a ventilator formed of open rail shutters, sliding either vertically or horizontally; the expansion of the bar causing the compound lever to open the shutters, and its contraction to close them.—[*Inrolled in the Inrolment Office, February,* 1835.]

To **Frederick Chaplin,** *of Bishops Stortford, in the county of Herts, tanner, for his invention of an improvement in tanning hides and skins of certain descriptions.*— [Sealed 18th February, 1836.]

The particular kind of hides and skins upon which the proposed improvements are to be exercised, are described as the hides of bulls, oxen, cows, buffaloes, horses, East Indian kips, and market calf skins.

The Patentee enumerates a number of modes of operating which have been introduced of late years as improvements in the process of tanning, such as fixing the skins in frames or forming them in bags, and causing the tanning liquor to penetrate through the skins by hydrostatic pressure; and by suspending skins in vessels, and forcing the tanning matter through them by pneumatic or hydraulic pressure. These, however, he states, have not been found to answer the purpose.

The Patentee then proposes, as his improvement, to sew up the skins as bags, and to pour the liquor into such bags, and allow it to ooze through a mode of which we do not perceive the novelty, excepting that it may not have been heretofore employed upon the particular kind of skins mentioned above; but sheep and other small skins have been so treated.

The hides or skins having been divested of their hair, and prepared for tanning, are to be sewn up round their edges into the form of a bag, leaving a small opening for the admission of the tanning matter which is to be introduced, the workmen holding up the bag by hand while it is filled; and when that is done, the apparatus is to be closed by tying it up.

The bag being nearly filled with tanning matter, the liquor will in the course of a short time ooze through the pores of the skin and run away into the tan pit, leaving a considerable portion of the tanning matter behind in the substance of the skin; and in order that the tanning operation may be equally applied to all parts of the skin, the bag is to be frequently turned over in every direction, which the Patentee says he is enabled to do with great facility, by having dispensed with any frame or apparatus for holding it.

As the tanning matter escapes from the interior of the bag the aperture is to be opened, and a fresh supply introduced, in order to keep swelled out and as nearly full as possible. It is stated that by the use of these means, and the employment of a sufficiently strong tanning liquor, the thickest hide may be perfectly tanned in seven or eight days, or a calf-skin or horse's-skin in forty-eight hours.

The liquor proposed to be used is to be made from the *Terra Japonica,* or catechu, in the proportion of about one hundred weight of the material infused in a hundred gallons of boiling water; and this, which is enough for about thirty hides, must be well stirred in order to dissolve it as nearly as possible: then add ordinary tanning ooze to fill up the vat, the strength of which is not very important. This may be renewed occasionally by adding a fresh supply of the Terra Japonica.

When the hides are sufficiently tanned, the bags are to be ripped open and well washed, and if required, the edges which have been stitched may be cut off in narrow strips.

If the operation has been performed on sole leather, it should be steeped for an hour in oak bark ooze, and when washed, hung up to dry; but if for dressing leather, half a hundred weight of sumach should be dissolved in fifty gallons of boiling water, and then mixed with the ordinary bark ooze: in this solution the hides may be steeped for eight-and-forty hours, having during that time been frequently shifted, and when washed must be hung up to dry. When the skins have become partially dry, a small quantity of cod oil may be rubbed on both surfaces, and then the drying may be carried on by the ordinary means.

The Patentee says, in conclusion, that he considers his improvement to consist, " first, in tanning the hides or skins of bulls, oxen, cows, buffaloes, horses, East Indian kips, and market calf-skins, by simply sewing them into bags, and filling such bags with the tanning liquor, and permitting it to percolate through, and frequently replenishing them with fresh liquor; and by frequently moving or turning over such bags on suitable surfaces, for admitting the liquor to run into a vat or receptacle, such process being conducted without the aid of additional hydrostation, or pneumatic pressure, with any wooden frame, or cage, or artificial heat which have been heretofore considered necessary, when endeavouring to tan the hides or skins of bulls, &c. by a quicker process than that of steeping in pits, as is the general means.

"Secondly, in the application of an ooze or tanning liquor, obtained from Terra Japonica, when employed with the particular process of tanning above described, as applied to the certain descriptions of hides and skins above mentioned.

" And lastly, I do not claim the tanning of such hides or skins by that liquor or ooze, the same having been before used when tanning such descriptions of hides and skins in pits."—[*Inrolled in the Inrolment Office, August*, 1836.]

To GEORGE RICHARDS ELKINGTON, *of Birmingham, in the county of Warwick, gilt toy maker, for his invention of an improved method of gilding copper, brass, and other metals or alloys of metal.*—[Sealed 24th June, 1836.]

THIS invention consists in gilding copper, brass, and other metals, or alloys of metals, by means of potash or soda combined with carbonic acid, and with a solution of gold.

The Patentee states, that in order his invention may be fully understood, he will describe the process, which has been found fully to answer the purpose; the articles operated upon having a very beautiful appearance, and in most instances have been considered to be gilded in a superior manner to those articles submitted to the gilding process where quicksilver is used.

The process of gilding by the aid of quicksilver being well known, and in general practice, no description of it will be necessary. I will, therefore, says the Patentee, first describe the preparation of the materials, and then explain the process of using the same.

Dissolve five ounces, troy weight, of fine gold in fifty-two ounces, avoirdupois weight, of nitro-muriatic acid of the following proportions, videlicet: twenty-one ounces of nitric acid, pur. of 1·45 specific gravity; seventeen ounces of muriatic acid, pur. of 1·15 specific gravity; and fourteen ounces of distilled water.

The gold being put into the mixture of acids and water, they are to be heated in a glass or other convenient vessel till the gold is dissolved; and it is usual to continue the application of heat after this is effected, and until a reddish or yellowish vapour ceases to rise. The clear liquid is to be carefully poured off from any sediment which generally appears and results from a small portion of silver, which is generally found in alloy with the gold. The clear liquid is to be placed in a suitable vessel of stone, pottery ware is preferred. Add to the solution of gold four gallons of distilled water, and twenty pounds of bicarbonate of potash of the best quality; let the whole boil moderately for two hours, the mixture will then be ready for use.

The liquid being thus prepared, and as in practice it is difficult to keep the liquid hot in stone-ware vessels when many articles are being dipped, it has been found advantageous to transfer the liquid to a cast iron vessel, which it is necessary to keep very clean.

The articles to be gilded having been first perfectly cleaned from scale or grease, they are to be suspended on wires, conveniently for a workman to dip them in the liquid, which is kept boiling. The time required for gilding any particular article will depend on circumstances, partly on the quantity of gold remaining in the liquid, and partly on the size and weight of the article; but a little practice will readily produce sufficient judgment to the workman.

Supposing the articles desired to be gilded to be brass or copper buttons, or small articles for gilt toys, or ornaments of dress, such as earrings or bracelets, a considerable number of which may be strung on a hoop, or bended piece of copper or brass wire, and dipped into the vessel containing the boiling liquid above described, and moved therein, the requisite gilding will be generally obtained in from a few seconds to a minute; this is when the liquid is in the condition above described, and depending on the quality of the gilding desired; but if the liquid has been used some time the quantity of gold will be lessened, which will vary the time of operating to produce a given effect, or the colour required, all which will quickly be observed by the workman; and by observing the appearance of the articles from time to time, he will know when the desired object is obtained, though it is desirable to avoid taking the articles out of the liquid as much as possible.

When the operation is completed, the workman perfectly washes the articles so gilded with clean water; they may then be submitted to the usual process of colouring.

If the articles be cast figures of animals, or otherwise of considerable weight, compared with the articles above mentioned, the time required to perform the process will be greater.

In case it is desired to produce what is called a dead appearance, it may be performed by several processes: the one usually employed is to dead the articles in the process of cleaning, as practised by brass-founders and other trades: it is produced by an acid, prepared for that purpose, sold by the makers under the term "*deading aquafortis*," which is well understood.

It may also be produced by a weak solution of nitrate of mercury, applied to the articles previous to the gilding process, as is practised in the process of gilding with mercury, previous to spreading the amalgam, but generally a much weaker solution; or the articles having been gilded may be dipped in a solution of nitrate of mercury, and submitted to heat to expel the same, as is practised in the usual process of gilding.

It is desirable to remark that much of the beauty of the result depends on the well cleaning of the articles, and it is better to clean them by the ordinary processes, and at once pass them into the liquid to be gilded.

The Patentee says, he has always employed the usual means for cleaning the articles from scales, and other impurities, which are commonly resorted to, in working of the metals for other purposes, when the surfaces are required to be freed from scales or other impurities; and remarks, that great care should be observed in purchasing the articles above described, of the best description.

In conclusion, the Patentee says, "I have described only the using of bicarbonate of potash, which I believe to be the best material for the purpose; and I would remark, that soda in a state of carbon may be employed, but so far as my experience goes, not with such advantage as potash in a state of bi-carbonate, as above described.

"Having now described the nature of my invention, and the manner of performing the same, I would have it understood, that although, in order to give the best information in my power, I have stated exact quantities of the articles employed, I do not confine myself thereto, nor do I claim any process for cleaning or deading; but what I claim as the improved process of gilding, secured by the present Letters Patent, is the gilding copper, brass, or other metals or alloys of metals, by means of potash or soda, combined with carbonic acid, and with a solution of gold, as above described."—[*Inrolled in the Inrolment Office, December*, 1836.]

To JOH GEORGE EDMUNDS, *of St. Mary's-square, Birmingham, in the county of Warwick, gentleman, for his invention of a philosophical alphabet, arranged, of letters, forms, or figures, by which the articulate sounds of languages may be scientifically denoted.*—[Sealed 13th April, 1832.]

THIS is an extremely ingenious and curious project, though the ideas are not new, nor is the scheme by any means likely to be brought into useful application. It is an attempt to exhibit by characters all the articulate sounds which the human voice is capable of uttering; and of consequence affording the means of writing any language in such a way, that the true pronunciation of every word may be perceived, and must be expressed by reading it.

It is well-known that many of the letters of the alphabet have different sounds, according to their connexions; and that the proper sounds of the letters in their varied positions, can only be known by a familiar acquaintance with the language: this is also the case in other languages, and therefore it is impossible to catch the true or approved pronunciation by reading words in a language the sounds of which we are unacquainted with.

A very long treatise might be written upon this subject, and perhaps some very amusing and instructive matters detailed; but this the Patentee has not thought it proper to do in his specification, though, we believe, he has done it elsewhere.

The subject is divided into three heads: firstly, the formation of written characters, representing the several articulate sounds of which the human voice is susceptible; secondly, their adaptation to express those sounds and, by combination, words in any language; and thirdly certain marks to be added to the characters for the purpose of expressing modulations of the voice and emphasis.

The forms of the characters which are to express the articulate sounds are set out (about fifty in number), each of which is to express the sound of a letter as ordinarily used by us in certain positions or connexions, of which examples are given; consequently several characters are used, as equivalent to one of our letters, and are severally to be taken according to the particular articulate sound intended to be given.

The adaptation of these characters to writing are in the same sort of combination as ordinary letters employed for forming words; but as the articulate sound of each character is definite, and they are to be used without regard to the letters employed in the common mode of spelling, the expressions of sounds in reading any word cannot be arbitrary, but must be the precise sound which the word should have.

As regards the marks expressive of modulations of the voice, they may be very well conceived, as some such marks are commonly placed over syllables in pronouncing dictionaries and other works on elocution.*

The English language being extremely flexible and abundant in articulate sounds, may, perhaps, afford better means of constructing such a scheme as that above described than any other language; but even this must be very limited as to the practicability of applying the machinery here proposed to languages in general. We have very great doubts, knowing as we do, that beside a thousand other difficulties, every language has some sounds which are peculiar to its own people, and which it is next to impossible for any but a native to articulate. We should conceive this scheme would present almost as many impediments to being brought into use, as the often attempted but never accomplished articulating machine.—[*Inrolled in the Inrolment Office, October,* 1832.]

SCIENTIFIC NOTICES.

A Treatise on the Teeth of Wheels, demonstrating the best forms which can be given to them for the purposes of machinery, such as Mill-work and Clock-work, and the art of finding their numbers. Translated from the French of M. Camus, by John Isaac Hawkins, Civil Engineer. Second edition, illustrated with 18 plates. J. Weale, London.

This is an exceedingly clever and useful work, both to practical and theoretical mechanics: the former it incites to study the best form for the teeth of his gear work, and shows him how to calculate them mathematically, without depending entirely upon his practical knowledge; and the latter it warns that "theory without practice, and practice without theory, are equally apt to produce monsters; while theory and practice legitimately united, will bring forth the most beautiful and useful results."

We quote the words of the Editor, pointing out the importance to engineers of a perfect acquaintance with this subject, he says :—

> "The perfection of the most simple, as well as the most complicated, engines, depends greatly upon the due action of the teeth of the wheels with each other, or, in other words, on the best form for ensuring their proper action with the least friction,

and, of course, with the least wear and loss of power. It is needless here to state of what vast consequence the numerous and immense machines are to the manufactures of this country, or what prodigious sums of money are involved therein. It is, therefore, of great importance, that the best form for the teeth of wheels should be ascertained on true mathematical principles, and that they should not be left, as is too much the case, to the random guesses of the workmen. If the teeth of wheels be properly constructed, the work is more equably performed, and of course is better done, less force or moving power is requisite, or more work may be done with a given power; and to crown all, the whole machinery has greater durability, consequently costs less for repairs, and occasions less loss of valuable time, by not being so frequently obliged to stand still. Now the saving of power, of expense, and of time in repairs, are objects by no means to be lightly thought of."

Under the impression of the urgent necessity there is for a work which would make the practical mechanic intimately acquainted with this so long neglected branch of mechanics, the publisher was induced to procure a translation of that part of M. Camus's "Cours de Mathematique," which treats of the form of the teeth of wheels. Mr. Hawkins possesses an extensive knowledge of practical science: he has undertaken the task, and has given us, in conjunction with his own views, the mathematical principles as set out by M. Camus, on which mill-gearing should be constructed. The work is illustrated by eighteen plates, showing the best forms of teeth, and the method of calculating them for all the possible variations of position in which they may be required to act. We recommend the work to the attentive perusal of practical mechanics, as containing a fund of useful information, highly interesting, if not indispensably necessary, in the various applications of the mechanical arts.

An Analysis of the British Ferns and their Allies, with Copper-plate Engravings of every Species and Variety. GEORGE W. FRANCIS. London: Simpkin and Marshall, 8vo. 68pp.

A knowledge of botany is of much greater importance to operatives engaged in the arts and manufactures, than may be generally supposed. The exercise of the arts of design extend through a very wide field of our manufactures, calling into action not only the inventive genius, but also the taste of the various artisans employed; and how can that genius be directed and applied, or that taste be judiciously displayed, without a competent knowledge of the elements of the science or art from which such designs are to be derived?

Botany, of all other natural resources, provides the most extensive range of subjects suited to elegant design; and no class of that science has been more happily applied to the decorative arts, than the class Cryptogamia (Ferns). With this view of the subject, we feel it rather a duty incumbent upon us, to lead our readers (particularly that portion of them connected with the arts of design) to the consideration of the small, but by no means trifling work, which is announced at the head of this article.

Of the merits of this work, we need only say that it appears to be an original production, the result of indefatigable labour, directed by an extensive knowledge of the subject, and given with clearness and perspicuity; and that the modest form in which the author has communicated his acquired information, and the very small price of his little volume, recommend it forcibly in our estimation to that class of our readers, particularly to whom we have above alluded.

OBSERVATIONS UPON MR. MACKINNON'S BILL, "TO AMEND THE PRACTICE RELATING TO LETTERS PATENT FOR INVENTIONS," &c.

Respectfully addressed to the Consideration of Members of the Legislature.

If from amongst the various subjects which at this moment press on the attention of Parliament, one should be selected for its important bearings upon the great commercial interests of this country, for its nationality, for its prospective beneficial results, and for its claims to be calmly considered without any excitement of that excusable* party-feeling which attaches to most matters of public discussion—that subject would be the relief of the genius and inventive talent of this manufacturing nation, from the oppression and difficulties under which it has hitherto laboured, for want of *a systematic Code* of Patent Law, combining simplicity of forms, efficient protection, and reasonable price.

The attention of our statesmen and legislators appears never to have been sufficiently directed to the necessity of treating the subject of Patent Law and practice as an affair of *national policy*, both as it regards our internal prosperity, and our external commercial relations over the whole globe; it has never been considered by those who direct the concerns of this country, that the combined rivalry of foreign nations, jealous of our manufacturing superiority, and present commercial pre-eminence, can alone be effectually met by giving vitality and energy to the immense mass of dormant inventive talent throughout this country, which can ever be rendered available to its possessors, and to the public, but by a complete re-modelling of our antiquated and expensive system of Patent Law and practice.

The amendment of this system is, I will acknowledge, surrounded with difficulties and perplexities of a peculiar character; but they are not insurmountable, and the attention of Parliament being once fixed upon the importance of the subject, the wisdom of Parliament can certainly apply the proper remedies.

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* Query, *inexcusable*.—Ed.

To appreciate the value that should be attached to the well-intentioned endeavours of any member who will undertake the almost forlorn hope of Patent practice amendment, we need only cursorily advert to the attempts which have preceded the present Bill of Mr. Mackinnon, upon this difficult point of legislation. In the Session of 1829, the Honourable House of Commons appointed a Committee of Inquiry into "the Law and Practice of Patents for Inventions," with directions "to report the evidence, *and their observations thereon*, to the House." The Committee was composed of able men from both sides of the House; they examined witnesses at great length—reported their evidence, but found the subject "*so intricate and difficult*," that notwithstanding "their earnest recommendation to be re-appointed early in the next Session," they relinquished the "intricate and difficult" business, and were never re-constituted for the purpose of making that report, which could alone have given an operative result to their previous labours.

The Reform Bill engrossed the attention of Parliament for the two succeeding Sessions; but in that of 1833, Mr. Godson introduced his Patent Law Amendment Bill; it was divided into two, for the purpose of separating the more questionable amendments; the first Bill passed the Commons, the second Bill went through Committee;—they together embraced many important ameliorations; but were defective in detail as a system, or code of Patent Law and practice. These two Bills were superseded by Lord Brougham's Act, which contains some material improvements, not worded in the best manner (so far as words are intended to convey precise meaning)—but Lord Brougham's Act has left all the principal grievances of which men of inventive talent complain, perfectly unremedied. Lord Brougham's acknowledged great talents were not applied to the "intricate and difficult" portions of the subject, the real protection of invention as a matter of personal property, *and of personal right*, the abrogation of the useless antiquated forms of passing Patents, the complete simplifying of the process as a matter of commercial arrangement effecting the great interests of the country, the substitution of one Patent in one "United Kingdom" for three complicated Patents; and finally, the reduction of the heavy stamp duties, and onerous State and Chancery fees. Without this reduction, all other improvements are sealed from the great mass of inventors, whose combined talent, industry, and knowledge, would add incalculably to the wealth and resources of the Empire, and to our means of competing, in every part of the globe, with the increasing efforts of rival powers, who are continually progressing in those combinations of capital, skill, and enterprise, which must eventually have a deep effect upon our future commercial operations.

Mr. Mackinnon's Bill is very far from perfect in many principal points, especially in respect of necessary details for the security of inventors and of the public; and he has fallen into the error of placing his improvements beyond the reach of men of moderate means; but his Bill contains essential and important ameliorations *in principle;* the forms of taking out Patents are materially simplified; and security is afforded from the date of the petition: the heavy stamp duties are proposed to be repealed; and the numerous classes of fees and emoluments are abrogated by his Bill.

But it is important to impress on the attention of Parliament that the difficulties which are inherent to this intricate subject should secure to the *bona fide* endeavours of any Legislator who will undertake any thing like *a systematic* arrangement and amelioration of Patent Law and practice, the cordial and effective co-operation of men of every party to amend what is imperfect, and supply what is deficient in this Bill. To prevent its going into Committee because it is defective in its details, would be equally unjust and impolitic; such a course would disappoint the rational expectations and demands of thousands of men of inventive genius, who have been from year to year depending upon the wisdom and justice of the Legislature for a *Code* of Patent Law; such a course would be impolitic, by still continuing those restrictions, which exclude from profitable action and reciprocal benefit to the community, the buried treasures of inexhaustible resources of science, talent, skill, and enterprise, which would prove to this country richer mines of wealth than Potosi or Golconda possesses. To throw out this Bill upon second reading, would be to discourage every future attempt of individual endeavour to legislate upon this most important and most difficult subject.

Mr. Mackinnon stands pledged to facilitate every proffered improvement upon his Bill; it is but common candour to give him credit for the sincerity of his professions, and but Parliamentary justice to allow him to redeem his pledge.

THIS IS NOT A PARTY QUESTION; it is a question of equal policy, justice, and benevolence; the interests of official persons engaged in the present practice of patent-grants are insignificant when put into the balance against the great interests of the country; but fair compensations to all who are entitled to such can easily be arranged under this Bill. The prospective increase to the happiness, the internal improvement, the resources and the external commerce of this great empire, as the result of a good and *available system* of Patent protection to the inventive talent of the country, is incalculable. This is, *par eminence*, a question of British policy, of British improvement, and of British interests; and it should be treated with the generous sympathies of PATRIOTIC BRITISH LEGISLATION.

JULIUS LUDOLPHUS SCHRODER.

Brixton, 10*th April*, 1837.

List of Patents

Granted by the French Government from the 1st of January, 1836.

(Continued from p. 48.)

To Claude Auguste Trichon, for sleeping cushions to be fixed inside of carriages.

To Alexandre Francois Selligne, of Paris, for improvements in the instruments used for boring the earth.

— Caiman Duvergier, of Paris, for a new kind of bit called by him Lycos.

— Jean Batiste Jarry, of Paris, of an improved rotary steam-engine.

— Pouillet Brothers, for a new apparatus for heating houses.

— Valentin Geoffroy, of Castlenaudry, for a thrashing machine.

— James Coltam, of Rouen, for an improved steam engine.

— Charles Sapey, member of the Chamber of Deputies, for an improved mill for grinding plaster of Paris.

— Alexis Jean Baptiste Camus, of Paris, for a mechanism for raising and lowering the buckets of a well, and emptying them without the help of an attendant.

— Rolland Degrege and Rimbert, for a mechanical lamp.

— Duvoir and Co. of Paris, for a machine for washing by steam.

— Lecour, of Paris, for a smoke-consuming apparatus.

— Darvien, Canvy, and Durand, for certain apparatus for stiffening cocoons by the agency of the heat produced from a naked fire, without any danger of burning the silk.

— Zacharie Gaspard Adam, of Montpelier, for an apparatus for rectifying alcohols extracted from sour wines.

— Jean Netrebski, of Paris, for an improved steam-engine.

— Bellot Sellier, Tardy and Illig, for a machine for manufacturing with one blow several detonating caps.

— Eugene Maire, of Havre, for an apparatus to be used as a motive power, and actuated by the muscular strength of man in conjunction with his weight.

— Andre Jean, of Villeneuve, for improvements on ploughs.

— Gourdin Rimette, of Gravelines, for a sewing machine.

PATENTS FOR FIVE YEARS.

To Louis Cesar, locksmith, of Nancy, represented in Paris by Mr. Perpigna, advocate of the French and Foreign Office for Patents, quarter rue Choiseul, for an improved air-valve, applicable to all sorts of bellows.

— Jean Marie Letestu, represented by Mr. Perpigna, for a new kind of lock.

To Gauthier-Lespert, represented by Mr. Perpigna, for an improved gas generator for domestic use.

— Nicolas Jannin, of Dunkerque, represented in Paris by Mr. Perpigna, for improvements in mechanical lamps.

— Robert Websser, of St. Pierre les Calais, represented in Paris by Mr. Perpigna, for improvements on the circular net frame.

— Henri Herz, of Paris, represented by Mr. Perpigna, for an instrument in giving agility to the fingers in playing on the piano, and called by him *dactylion.*

— De Gobart Pierart, of Dunkerque, represented in Paris by Mr. Perpigna, for an improved waggon.

— Jean Antoine Raymond, of Paris, for a new kind of wooden flooring for rooms.

— Laurent and Labanne, of Montbiliard, for the substitution of conical rollers to hammers, in the making of saucepans and kitchen utensils.

— Pierre Ravier, gun-maker, of St. Etienne, for improvements in fire-arms.

— Louis Pelissier, of Lyon, for a compass for tracing spiral lines.

— Jean Couture, of Paris, for an improved clog to preserve the feet from wet.

List of Patents

Granted in Scotland between 22nd March and 22nd April, 1837.

To Samuel Jenkin Jones, of Manchester, merchant, for certain improvements in the tanning of hides and skins.—29th March.

— Charles Brandt, of Upper Belgrave-place, London, mechanist, for an improved method of evaporating and cooling fluids.—31st March.

— Charles Pierre Devereux, of Fenchurch-street, London, merchant, in consequence of a communication made to him by a foreigner residing abroad, a new or improved apparatus for preventing the explosion of boilers, or generators of steam.—7th April.

To William Hancock, of Windsor-place, London, for certain improvements in bookbinding.—8th April.

— Richard Burch, of Heywood, county of Lancaster, mechanist, for certain improvements in locomotive steam-engines, to be used either upon rail or other roads, which improvements are also applicable to marine and stationary steam-engines.—14th April.

— Henry Backhouse of Walmsley, Bury, calico printer, and Jeremiah Grime, of Bury, engraver, for certain improvements in the art of block printing.—14th April.

— William Nairne, flax-spinner, Millhaugh, near Methven, in the county of Perth, for a certain improvement, or certain improvements in the machinery of reels, used in reeling yarns.—14th April.

— Bennett Woodcroft, late of Ardwick, in the parish of Manchester, in the county of Lancaster, but now of Mumps, in the township of Oldham, in the same county, gentleman, for an improved mode of printing certain colours on calico and other fabrics.—18th April.

New Patents

SEALED IN ENGLAND,

April, 1837.

To Michel Berand Lauras, of Lyons, but now residing in Leicester-square, in the county of Middlesex, merchant, for his invention of certain improvements in steam navigation.—Sealed 4th April—6 months for inrolment.

To Henry Booth, of Liverpool, in the county of Lancaster, esquire, for his invention of improvements in the construction of locomotive engine-boiler furnaces, applicable also to other furnaces.—Sealed 4th April—6 months for inrolment.

To William Wynn, of Dean-street, in the parish of St. Anne, Soho, in the county of Middlesex, clockmaker, for his invention of a certain improvement or improvements in apparatus for diminishing the evaporation of vinous, alcoholic, acetic, and other volatile vapours, and for preventing the absorption of noxious effluvia in vinous, spirituous, acetous, and other fluids, such as wines, spirits, malt liquors, cyder, perry, and vinegar.—Sealed 4th April—6 months for inrolment

To Joseph Amesbury, of Burton-crescent, in the parish of St. Pancras, and county of Middlesex, surgeon, for his invention of certain apparatus for the relief or correction of stiffness, weakness, or distortion in the human spine, chest, or limbs.—Sealed 4th April—6 months for inrolment.

To William Weekes, of King Stanley, in the county of Gloucester, clothier, for his invention of certain improvements in the dressing or finishing of woollen and other cloths or fabrics requiring such a process.—Sealed 4th April—2 months for inrolment.

To Joseph Lincoln Roberts, of Manchester, in the county-palatine of Lancaster, merchant, for a certain improvement or certain improvements in looms for weaving, being a communication from a foreigner residing abroad.—Sealed 11th April—6 months for inrolment.

To Reuben Bull, of Adam-street West, Portman-square, in the parish of St. Marylebone, and county of Middlesex, ironmonger, for his invention of certain improvements in chimney caps to facilitate the discharge of smoke and to prevent its return.—Sealed 15th April —6 months for inrolment.

To Horatio Nelson Aldrich, of Rhode Island, in the United States of America, but now of Cornhill, in the city of London, merchant, for certain improvements in spinning, twisting, doubling, or otherwise preparing cotton, silk, and other fibrous substances, being a communication from a foreigner residing abroad.—Sealed 15th April—6 months for inrolment.

To Henry Stephens, of Charlotte-street, in the parish of St. Marylebone, in the county of Middlesex, gentleman, and Ebenezer Nash, of Buross street, in the parish of St. George in the East, and county of Middlesex, tallow-chandler, for their invention of certain improvements in manufacturing colouring matter, and rendering certain colour or colours applicable to dyeing, staining, and writing.—Sealed 18th April—6 months for inrolment.

To David Napier, of the York-road, Lambeth, in the county of Surrey, engineer, for his invention of improvements in letter-press printing.—Sealed 18th April—6 months for inrolment.

To Thomas Hancock, of Goswell-mews, Goswell-road, in the county of Middlesex, waterproof-cloth manufacturer, for his invention of an improvement or improvements in the process of rendering cloth and other fabrics partially or entirely impervious to air and water, by means of caoutchouc or India-rubber.—Sealed 18th April—6 months for inrolment.

To William Crofts, of New Radford, in the county of Nottingham, machine maker, for his invention of improvements in the manufacture of figured or ornamental bobbin net or twist lace or other fabrics.—Sealed 18th April—6 months for inrolment.

In pursuance of the report of the Judicial Committee of his Majesty's Privy Council, to Edmund Haworth the younger, of Bolton, in the county of Lancaster, gentleman, of the sole use, benefit, and advantage, of the invention of William Southworth, formerly of

Sharples, near Bolton-le-Moors, in the county of Lancaster, bleacher, of certain improvements in certain machinery or apparatus adapted to facilitate the operation of drying calicoes, muslins, linens, or other similar fabrics, within England, Wales, and the town of Berwick upon Tweed, for the further term of five years, pursuant to the statute in such case made and provided.

To Charles Farina, of Clarendon-place, Maida-vale, in the county of Middlesex, gentleman, for his invention of an improved process, to be used in obtaining fermentable matter from grain, and in manufacturing the same for various purposes.—Sealed 18th April—6 months for inrolment.

To Lemuel Wellman Wright, of Manchester, in the county of Lancaster, engineer, for his invention of certain improvements in machinery or apparatus for bleaching or cleansing linens, cottons, or other fabrics, goods, or other fibrous substances.—Sealed 20th April, —6 months for inrolment.

To William Gratrix, of Springfield-lane, Salford, in the county of Lancaster, silk dyer, for his invention of certain improvements in the process of bleaching or cleansing linens, cotton, and other fibrous substances, and also improvements in the process of discharging colours from the same, either in the raw material or manufactured state.—Sealed 22d April—6 months for inrolment.

To John Gottlieb Ulrich, late of Nicholas-lane, in the city of London, but now of Red Lion-street, in the parish of St. Mary, Whitechapel, and county of Middlesex, chronometer maker, for his invention of certain improvements in chronometers.—Sealed 22nd April—6 months for inrolment.

To Sir George Cayley, Bart., of Brompton, near Malton, in the county of York, for his invention of certain improvements in the apparatus for propelling carriages on common roads or railways, part of which improvements may be applied to other useful purposes.—Sealed 25th April—6 months for inrolment.

To James Pim, jun., of College-green, in the city of Dublin, banker, and Thomas Fleming Bergin, of Westland-row, in the same city, civil-engineer, for their invention of an improved means or method of propulsion on railways.—Sealed 25th April—6 months for inrolment.

To Miles Berry, of the Office for Patents, Chancery-lane, in the county of Middlesex, patent-agent, for certain improvements in machinery or apparatus for making or manufacturing bricks, tiles, and such other articles, being a communication from a foreigner residing abroad, —Sealed 27th April—6 months for inrolment.

To Miles Berry, of the Office for Patents, Chancery-lane, in the county of Middlesex, patent-agent, for certain improvements in machinery or apparatus for making or manufacturing horse-shoes, being a communication from a foreigner residing abroad.—Sealed 27th April—6 months for inrolment.

To Henry William Craufurd, of John-street, Berkeley square, in the county of Middlesex, commander in the Royal Navy, for an invention of an improvement in coating and covering iron and copper for the prevention of oxydation, being a communication from a foreigner esiding abroad.—Sealed 29th April—6 months for nrolment.

CELESTIAL PHENOMENA, FOR MAY, 1837.

D.	H.	M.	
1			Clock after the ☉ 3m. 5sec.
	—		☽ rises 3h. 38m. M.
	—		☽ passes mer. 9h. 28m. M.
	—		☽ sets 3h. 20m. A.
3	7	31	☿ greatest Hel. Lat. N.
4	0	48	♀ in conj. with the ☽ diff. of dec. 1. 51. S.
	1	39	♄ oppo. to the ☉
			☉ eclipsed invisible.
	7	2	Ecliptic conj. or ● new moon.
	12	3	♃'s first sat. will em.
5			Clock after the ☉ 3m. 30s.
	—		☽ rises 4h. 33m. M.
	—		☽ passes mer. 0h. 30m. A.
	—		☽ sets 8h. 44m. A.
	23	40	☿ in conj. with the ☽ diff. of dec. 0. 33 S.
10			Clock after the ☉ 3m. 50s.
	—		☽ rises 7h. 59m. M.
	—		☽ passes mer. 4h. 50m. M.
	—		☽ sets 0h. 55m. M.
	—		Occul. λ in Caucri, im. 9h. 28m., em. 9h. 59m.
11			☽ in Apogee.
	3	52	♃ in conj. with the ☽ diff. of dec. 4. 30. S.
	12	45	♂ in □ with the ☉
12	2	31	♂ in conj. with the ☽ diff. of dec. 3. 23. S.
	5	39	☽ in □ or first quarter.
	19	54	☿ greatest elong. 21. 46. E.
15			Clock after the ☉ 3m. 56s.
	—		☽ rises 2h. 0m. A.
	—		☽ passes mer. 8h. 30m. A.
	—		☽ sets 2h. 33m. M.
	—		Occul. η in Virginis, im. 14h. 26m., em. 14h. 39m.
16	11	40	♃'s third sat. will em.
17			Mercury R. A. 5h. 4m. dec. 24. 51. N.
	—		Venus R. A. 8h. 35m. dec: 18. 49. N.
	—		Mars R. A. 9h. 45m. dec. 15. 17. N.
17			Vesta R. A. 22h. 38m. dec. 12. 14. S.
	—		Juno R. A. 13h. 22m. dec. 3. 13. N.
	—		Pallas R. A. 0h. 46m. dec. 1. 54. N.
	—		Ceres R. A. 2h. 37m. dec. 9. 17. N.
	—		Jupiter R. A. 8h. 54m. dec. 18. 21. N.
	—		Saturn R. A. 14h. 45m. dec. 13. 16. S.
	—		Georg. R. A. 22h. 40m. dec. 9. 12. S.
	—		☿ passes mer. 1h. 25m.
	—		♀ passes mer. 23h. 56m.
	—		♂ passes mer. 6h. 4m.
	—		♃ passes mer. 5h. 13m.
	8	46	♃'s second sat. will em.
18	1	12	♀ in sup. conj. with the ☉
	17	27	♄ in conj. with the ☽ diff. of dec. 3. 52. N.
20			Clock after the ☉ 3m. 48s.
	—		☽ rises 8h. 48m. A.
	—		☽ passes mer. M.
	—		☽ sets 3h. 42m. M.
	7	28	Ecliptic opp. or ○ full moon.
	10	22	♃'s first sat. will em.
22	23		☽ in Perigee.
24	11	20	♃'s second sat. will em.
25			Clock after the ☉ 3m. 26s.
	—		☽ rises 0h. 51m. M.
	—		☽ passes mer. 4h. 44m. M.
	—		☽ sets 8h. 46m. M.
	13	59	☿ stationary.
26	14	41	♅ in conj. with the ☽ diff. of dec. 3. 43. N.
	19	38	☿ in the descending node.
27	0	1	☽ in □ or last quarter.
29	3	21	♀ in the ascending node.
	14	47	♅ in □ with the ☉

J. LEWTHWAITE, Rotherhithe.

METEOROLOGICAL JOURNAL,

FOR MARCH AND APRIL, 1837.

1837.	Thermo.		Barometer.		Rain in inches.
	Hig.	Low.	High.	Low.	
March					
25	41	23	29,74	Staty.	
26	45	34	29,75	29,67	
27	40	15	29,92	29.89	
28	47	27	29,89	29,82	
29	52	31	29,68	29,63	
30	47	29	29,73	29,65	,125
31	45	16	29,85	29,80	
April					
1	51	21	29,84	29,83	
2	47	20	29,83	29,71	
3	49	29	29,47	29.45	,03
4	46	24	29,62	29,51	,0125
5	46	28	29,83	29,62	
6	47	25	29,88	29,80	
7	40	23	30,17	29,97	
8	45	27	30,25	30,21	,0125
9	43	22	30,21	30,16	
1837.	Thermo.		Barometer.		Rain in inches.
	Hig.	Low.	High.	Low.	
April					
10	43	19	30,05	29,88	
11	44	17	29,61	29,57	
12	42	16	29,67	29,60	
13	41	29	29,83	29,76	
14	49	28	29,82	29,77	
15	50	20	29,65	29,51	
16	39	27	29,42	29,37	,0125
17	49	28	29,74	29,55	
18	45	31	29,87	29,77	
19	55	36	29,88	29,86	
20	55	23	29,76	29,73	
21	43	22	29,72	29,62	,0125
22	50	29	29,52	29,50	,2
23	47	32	29,59	29,53	,05
24	57	29	29,72	29,61	,25
25	56	24	29,83	29,80	

Edmonton. CHARLES HENRY ADAMS.

Latitude 51° 37 32 N.
Longitude 3 51 West of Greenwich.

THE

London

JOURNAL AND REPERTORY

OF

Arts, Sciences, and Manufactures.

CONJOINED SERIES.

No. LXIII.

Recent Patents.

To GEORGE HOLSWORTHY PALMER, *of Manchester-street, Gray's Inn-road, civil engineer, for his invention of certain improvements in the steam-engine and boiler, and apparatus or machinery connected therewith, applicable to propelling vessels, carriages, and other purposes.*—[Sealed 16th September, 1831.]

THE Patentee states, that the object he has in view by his improvements in the steam-engine is, to render it less costly, more portable and effective, as well as more economical in its expenditure of fuel, than those engines now in use, whether required for the propulsion of locomotive carriages and steam vessels, or for giving motion to any other description of machinery The Patentee proceeds to state that, before referring to the drawings and descriptive reference of the same, he shall detail the abstract parts of the engine and boiler, which he claims as being novel, either in principal, or as regards their peculiar modification.

Firstly. The self-regulating blast apparatus, by which the quantity of fuel to be ignited in a given time, is governed, in order to ensure the generation of a volume of steam suited precisely to all the variable speeds and powers of the engine.

Secondly. The steam calorific self-adjusting apparatus, which acts in conjunction with the blast-regulator, and is so contrived as to lift the weight from the lever of a safety valve, and permit the steam to escape from the boiler, should the aforesaid apparatus fail of instantly checking its evolution. The safety valve is, however, only an auxiliary or secondary mode of ensuring security to the boiler, under circumstances which are not likely to occur.

Thirdly. The self-acting safety apparatus, by which the security of the boiler is ensured, should the apparatus for supplying it with water fail in its effect, so that in the event of the water in the boiler being reduced below a determined level, the process of combustion will be instantly suspended, and the boiler protected from injury.

Fourthly. Making the products of combustion, evolved from the furnace, escape into the atmosphere below the level of the furnace bars, which will most effectually prevent the admission of atmospheric air into the furnace, excepting that portion which the blast and calorific regulating apparatus permits the blower to project upon the fuel undergoing combustion. This mode shuts off the entrance of atmospheric air as effectually as if cocks or valves were resorted to; for the moment the blower is thrown out of action, the fuel in the furnace, however intense its inflammation, is instantly damped, in consequence of the ignited fuel being enveloped in an atmosphere of gaseous inflammable matter, which as effectually extinguishes inflammation as carbonic acid gas, or other non-inflammable gas, when oxygen, or the supporter of combustion, is not combined therewith. This is not individually claimed as new, but as a necessary arrangement in conjunction with the blast and calorific regulators which, together with the mode of raising the safety valve from its seat, he must be distinctly understood as claiming, not only as applied to a steam-engine, but also to every other description of boiler or vessel used for the purpose of evaporation or heating in the arts and manufactures whenever a regulated intensity of heat is required, let the purpose or object be what it may, or where a determinable temperature is required to be communicated, as in the purification of sugar, the distillation of spirits, &c. &c., through the medium of oils, fusible metals, and the like, instead of impinging the heat directly against the vessel containing the material intended to be so heated, it will be necessary, in this case, to generate the elastic fluid which gives motion to the small piston of the regulating apparatus in a copper or other close vessel about five inches diameter, as shown in the drawings.

Fifthly. The pipes leading from the opposite ends of the horizontal part of the boiler connected with the lowermost part standing at right angles thereto, act as stays to steady the whole; but the ostensible object of their introduction is to convey the water most remote from the direct action of the furnace by its own gravity, to re-place that portion which may be carried to the upper part of the boiler by the great volume of steam generated between the two concentric cylinders; the interior one (the furnace), but for this or a similar contrivance, would presently be destroyed by the intense action of the heat impinging thereon, inasmuch as the water in its attempt to descend perpendicularly into the space from whence it is constantly being projected would be steam-logged, and, consequently, prevented from absorbing the caloric so rapidly as it is taken up by the metal. On no consideration whatever, must other than distilled water or spirits be used in this boiler, for the deposition of earthy matter would lead to a rapid destruction of the boiler, and increase the consumption of fuel; and that in proportion as the capacity of the metal to transmit caloric through its pores, and from thence to the water in the boiler, is impeded by the slow conducting powers of the earthy incrustations thus deposited upon the heating medium.

Sixthly. To ensure a length of stroke in high-pressure engines (that is only limited by the maximum length the cylinder can be cast and bored), and that without increasing the diameter of the piston rods beyond that which is required to withstand the right line tug of the whole power of the engine, and which could never be accomplished were the piston rods subjected to an alternate tug and thrust, without resorting to the very objectionable short stroke and piston rod of so large a diameter, and without which it would be incapable of withstanding the thrust, without being crippled and rendered useless. It is the modification and disposition of the various parts of the engine that is claimed under this head, and not any one part abstractedly considered.

Seventhly. The side valve or valves, where more than one are used, with their various modifications, requiring neither casings nor stuffing boxes, I claim as perfectly novel; the action of these being seen, admit of mathematical adjustment by an effective mechanical arrangement (not claimed), and which enables the engineer instantly to reverse or stop the engine at pleasure.

Eighthly. For a modification of the crank and beam intended to supersede the use of a beam of the usual weight and dimensions, parallel motion, cross heads, and costly fittings and bearings connected therewith. This mode of converting the reciprocating into the rotative motion, accomplishes the grand desideratum of making one cylinder produce a more regular and equalised motion than can be accomplished by two cylinders when used to give motion to locomotive engines or paddle wheels.

Ninthly. The condensation by which highly elastic steam of any temperature may be converted into water, without the application of injections, or by the extension of surface, by making the cubic contents of the condensing chamber equal to the number of cubic inches of steam discharged each stroke of the engine, when expanded into or below atmospheric steam (disregarding the additional effect obtained by a diminution of temperature). The cubic contents of the condensing chamber being arranged to condense steam of a previously determined maximum density, will effect the condensation of steam of any intermediate elasticity between the said maximum and steam of one atmosphere; lower than this, little or no advantage will be obtained; and at atmospheric steam this mode is altogether inapplicable. To ensure this mode of condensation, it becomes a *sine quâ non,* that no steam be permitted to pass between the piston and its cylinder, or through the apertures in the valves that alternately shut off the communication between the cylinder and the condensing chamber, otherwise the condensation will partially cease, and that in proportion to the quantity of steam permitted to pass into the condensing chamber. It is also of great importance that the water be drawn from the condensing chamber as fast as it is formed or precipitated therein, and conveyed to the boiler by a small force pump or any other effective means, not only to prevent the cubic contents of the condensing chamber being diminished, but also to ensure a proper supply of distilled water to the boiler. The said condensing vessel to consist of one or more chambers, which may be made of light copper or other material. The sphere is preferred, as combining strength with great capacity. I accomplish the conversion of highly elastic steam into the liquid state exclusively by expansion, without regard to cooling surface. I claim also the making the condensing chamber of flexible material, as varnished canvass, silk, cotton, or other suitable air and steam-tight material, so as to allow of its alternate inflation, and collapsing every stroke of the engine, and to avoid rupture: should the steam ever arrive at an elasticity exceeding the atmospheric pressure, it must be enclosed in a wove wire casing, which will effect the object, and permit the atmospheric air entering and escaping with great facility, without checking the inflation or collapsing of the aforesaid condensing chamber. The more this condensing chamber exceeds the proportions given, the more effectual will be its operation, as the steam will expand with less resistance than in a vessel of less capacity, as it more resembles the process of turning highly elastic steam into the atmosphere.

Lastly. I claim not only all the aforesaid parts that are new, either in principle or modification of previously known mechanism, but also the general arrangement of the engine and boiler united as a whole, holding myself at liberty to combine these improvements under a variety of forms in which the same objects are effected, the external character varying as circumstances may require. The figure and form of the engine, as applied to locomotive carriages or paddle wheels of steam vessels, will be explained by the drawing and descriptive reference accompanying this specification.

Fig. 1, Plate VI., is an elevation of the machine, showing the disposition of the various parts; fig. 2, is a longitudinal section of the boiler and furnace, showing the flues, steam cylinder, &c.; fig. 3, is a transverse section of the boiler, furnace, and calorific regulator, showing its connexion with the blast regulator; fig. 4, is a sectional plan of the lower part of the boiler, furnace, and flues; fig. 5, is a longitudinal section of one of the slide valves with its seat; fig. 6, is a plan of the seat, showing the steam and condensing passages; fig. 7, is a section of an evaporating vessel in connexion with a metallic or other bath, showing the application of the calorific regulating apparatus. The same letters of reference are used to denote the same parts in all the views: A, is the boiler, in the lower part of which, and concentric with it, is placed the furnace B, secured to it by flanges, bolts, and nuts. The grate C, is supported upon an iron frame D, and is retained in its place by a wedge or other simple fastening; and by releasing which, the grate may be withdrawn when required. The furnace is replenished with fuel through an aperture in the crown, by means of a pipe extending outside the boiler, terminated by two slides or doors, which are alternately opened when fuel is admitted. To prevent the discharge of the heated gases, a rake is added, working in a stuffing box, to force the fuel into the furnace, should the pipe get choked. It is my intention, however, to adopt a self-acting mode of feeding the furnace with fuel, by means of fluted rollers, or other equally efficient means, and which will receive their motion from the steam-engine: E, E, E, E, are four or more fuel pipes, connected to the top of the furnace, and descending below the bottom of the ash pit, which prevents the natural flow of atmospheric air to supply the furnace. The exit of the pipes being carried below the level of the furnace is not claimed as new, but is adopted in preference to cocks or such like contrivances, in conjunction with the blast-regulating apparatus: F, F, are two circulating tubes, by which the annular space round the furnace is more uniformly supplied with water; G, a pipe, with its valves, through which the supply of water to the boiler is injected to replace the quantity evaporated; H, the injecting pump for supplying the boiler with water; I, the blowing apparatus, for injecting the requisite quantity of atmospheric air into the furnace; K, a pipe through which the atmospheric air is injected into the casing L, which surrounds the ash pit, between which a communication is formed by perforations in the lower part of the cylinder which constitutes the furnace; the blast is, by this means, rendered less partial in its action on the fuel. To one extremity of the pipe K, is attached a regulating valve or cover M, which, when closed, prevents the exit of the air contained in the pipe; the quantity of air discharged through this aperture depends on the area of the opening given to the valve. It is opened or shut, or otherwise adjusted by means of a screw and handle, or may be operated on by any other convenient means. This valve is used for regulating the quantity of atmospheric air passed through the furnace, suited to all the variations of resistance.

To the other extremity of the pipe K, is adapted a hinged valve or cover N, so weighted as to counterpoise the pressure of the air within the pipe when closed, compels the air discharged by the blowing apparatus to pass into the casing L, and from thence into the furnace through the flue pipes E, E, &c., into the atmosphere, excepting that quantity which may be discharged through the valve M. The use of this valve is to limit the temperature of the water, and consequently the pressure of the steam in the boiler, by permitting, when open, the discharge of a great portion of the atmospheric air otherwise required for combustion. To effect this object, the valve N, is connected by levers O, P, Q, with their necessary rods of communication to the calorific regulating apparatus R, which consists of a piston of sufficient area to overcome the resistance opposed to it working through a stuffing box in a cylindrical syphon tube containing a quantity of mercury, as a medium by which the steam passing from the boiler into the regulating chamber acts upon the aforesaid piston: S, a safety valve, with its graduated lever and weight. A loop T, is formed on the end of the lever, and embraces the screwed end of the regulator piston, when the nut V, comes in contact with the loop, the lever and safety valve are lifted effectually, preventing the occurrence of accidents should the safety valve remain closed beyond the limiting pressure. The action of the safety valve and lever is rendered simultaneous by two small connecting links W: X, is a chamber attached to the crown of the furnace, and connected by a tube Y, with a piston and cylinder of precisely the same description and construction as that used for the calorific regulator R, and may be placed in any convenient situation for operating on a safety slide cock or valve z, which, when the water in the boiler has evaporated so low as to endanger its safety from a deficiency of supply from the force pump, is closed, and completely prevents the passage of atmospheric air into the furnace; thus combustion instantly ceases, the ignited flue being deprived of air. The motion communicated to the piston by the steam generated in the chamber X, operates on the lever I, by the cam Q; the lever rising with the piston, until the cam or detent passes the pin 8; when the slide z, is instantaneously released, and falls by its own gravity, completely closing the passage through the pipe K. The combustion being suspended, the temperature of the water, and consequently the pressure of the steam, is instantly reduced; thus preventing the destruction of the boiler by the powerful action of the fuel, when the heating surface is unprotected by the water. For facilitating the reference, the regulators R, are arranged with a view to perspicuity rather than mechanical exactness.

It will be perceived that the safety slide z, with its appendages, have been omitted in fig. 1, lest it should have been rendered too confused. The steam cylinder, piston, and stuffing boxes being of the usual construction, do not require a particular description, the only peculiarity being the great length of the cylinder, compared with its diameter, and the small diameter of the piston rod.

The adjustment of the piston in the cylinder is effected by means of screws and nuts at the two extremities, where they are connected to the chains *s*, *s*, by the loops *r*, *r*. The slide valves *a*, *a*, are connected together by two adjusting side rods *b*, *b*, and have two apertures each, with a connecting chamber *c*. The seats have each three apertures of equal area with those in the slide, so that the alternate operation of admitting steam to the cylinder and condensing it, is produced without the aid of a casing or cover over the slide. The movement producing the alternating motion of the slides is of the tappet kind, capable of the nicest adjustment, by means of screws and nuts at each end of the tappet rods *d, d,* which also connect them with the chains: *e,* is a carriage for supporting the tappet lever *f,* and guide rollers *g, g,* against which the tappet rods rub, and by which they are prevented from deflecting out of the right line when brought into action. The side rods *b, b,* are united at *h,* the middle of their length, by a carriage furnished with friction rollers, which is embraced by the forked end of the tappet rods *f,* and by which the slides are moved. The pressure tending to lift the slides from their seats by the action of the steam in their passages, is counterbalanced by an external pressure, produced by two helical springs *k, k,* at the back of each slide; and the friction is diminished by two grooved rollers *l, l,* working on a guide, parallel to the face of the slide: *m,* is the condensing chamber, into which the steam is admitted after it has performed its office in the cylinder, where it is permitted to expand freely; the slide valve seats communicate with the upper part by the pipes *n, n,* which enter the chamber separately, or united in one pipe. The water produced by the condensation of the steam is drawn from the chamber by the force pump H, through the pipe and valves *o*; which chamber is furnished with an inverted safety valve *p,* to prevent collapsing. The steam is completely excluded from the engine by closing the slide valve *q.* The chains S, S, are fixed to the pulleys *t, t,* whose axes turn in bearings on the bracket *v, v,* firmly secured to the transverse bearers of the framework of the carriage. These pulleys should be more in circumference than double the length of the piston's stroke. The reciprocating motion of the pulley *t*, and the engine, produces the revolution or rotation of the crank shaft w, by means of a lever *x*, keyed on one end of the pulley axes, and intervention of the connecting rod *y*, the crank shaft revolving in bearings attached to the frame of the carriage. The radius of the lever *x*, must exceed, in a trifling degree, that of the crank *w*, *w*: *z*, a toothed spur-wheel, working into a pinion of half its diameter on the axis of the carriage wheels 5, so that the carriage performs a distance equal to twice the circumference of the wheels 5, for each double stroke of the engine. Any other proportions of the wheel and pinion may, of course, be adopted as the nature of the machine or the required speed of the carriage may render necessary. On the crank shaft w, is a pulley 6, grooved to receive a catgut band, for the purpose of driving the machinery to work the blowing apparatus. These wheels *z*, and pulley 6, have been represented by dotted lines to prevent confusion. The machinery for working the blowing apparatus consists of two pulleys 7, on an axis 8, supported on the brackets 9, fixed to the side frames of the carriage; one pulley to receive the motion from the crank shaft w, and the other to communicate the motion to the pulley 10, on the axis of the blowing fan: a greater number of pulleys may be found convenient to vary the velocity of the blowing fan according to circumstances. The pulley axis 8, is cranked to form a winch, by which the blowing apparatus can be worked by manual labour when the engine is at rest, and for which purpose a provision is made to disengage the pulley from the crank shaft w, by sliding the brass bearings in the bracket heads in the direction of the crank shaft. The catgut band will then be slackened, and the pulley will revolve without it: when it is required to be connected with the engine, the reverse of this operation will be necessary, in either of which positions the axis will be retained by a set screw 11. The force pump is worked by means of an adjusting crank 12, keyed on one end of the axis of the pulley *t*, and communicating with the pump piston by a connecting rod and slings 13. The pump is secured to a portion of the bracket *v*, projecting below the carriage frame. The application of the aforesaid engine, and machinery, and boiler, to the purpose of propelling vessels, will be evident from the preceding description, by considering the wheels 5, as the paddle wheels of the vessel. As a stationary engine, applied to various purposes in the arts and manufactures, the same arrangement is used, with the substitution of a fly wheel in the place of the wheels 5. The application of the calorific regulating apparatus to the purposes of heating or evaporating by means of a bath, composed of metallic fluid or other heating medium, is shown in fig. 7, where *a*, is the evaporating vessel, *b*, the heating medium, and *c*, the vessel in which the steam is generated by the heat which the medium acquires from the furnace *d*, to act upon the regulator piston, and ultimately, by the intervention of the pulleys *e*, *e*, lever *f*, and chain or rod *g*, on the damper *h*, by which the quantity of atmospheric air admitted into the furnace for the combustion of the fuel is regulated. In some cases, a second damper between the furnace and the chimney shaft is an advantage, and may be operated on by the same pulleys simultaneously with the damper *h*, which admits the atmospheric air to the furnace.—[*Inrolled in the Inrolment Office, March*, 1832.]

[We understand that since the specification of this patent, Mr. Palmer, the ingenious inventor, has made several important improvements on the above, which, we believe, will shortly appear before the public; but, as it is our duty to lay before our readers the specifications of all patents as they originally appear, and without any of the after improvements, we have, therefore, refrained from making any comments upon the invention, or noticing any of the numerous improvements or alterations that the inventor has made; we hope, however, soon to have the pleasure of presenting our readers with the results of some of the numerous and well-conducted experiments that Mr. Palmer has successfully carried into execution.—Ed.]

To JOSEPH LIDEL, *of Arundel-street, Panton-square, in the county of Middlesex, professor of music, for an invention communicated to him by a certain foreigner residing abroad, of certain improvements in piano-fortes.*—[Sealed 17th February, 1836.]

THESE improvements in piano-fortes, consist, in the first instance, in two novel arrangements, combinations, or constructions of mechanism or parts, forming what is technically called the "action" of a piano-forte, by which the hammers are caused to strike upon the strings, and produce the notes; both of which constructions have for their object, the quick escape, removal, or discharge of the hammer from the string after striking, in order to avoid interrupting the free vibration of the string or sounding of the note; and, in addition to these, there are improvements in the means of bringing the pedal into operation upon the said mechanism, for the purpose of shortening the stroke of the hammers for producing piano and crescendo, without changing the character of the sound of the notes. And further, in the manner of connecting the box or frame containing the keys and "action" to the instrument, for the purpose of allowing an easy access to the strings and pegs when the instrument has to be tuned, the hammers remaining in a proper position for sounding notes during the tuning operation. The second feature of these improvements, is a peculiar construction of sounding board for piano-fortes, the parts of which board are intended to correspond in their vibrations with the respective strings distended over them.

Fig. 8, Plate VI., is a side elevation of a key, with the mechanism of one of the novel arrangements or constructions of "action" as adapted to an horizontal piano-forte; parts of the instrument being shown in section. The action of the hammer in this arrangement is designed to strike downward upon the strings; the keys and mechanism in this figure being shown in the quiescent state. Fig. 9, shows the positions of the parts after the note has been struck, and the hammer has escaped or been removed from the string which is free to vibrate: A, is the key; B, the hammer; C, the string; D, the damper. The key is mounted in the instrument in the usual manner, but carries at its inner end the piece *c*, with a hook *d*, screwed into it, which takes into a peculiarly formed notch *e*, in the tail piece of the hammer, moving its fulcrum on a pin at *h*. The lever *l*, of the damper is connected to the ledge *k*, by the joint *o*, and to the key by a hook *y*.

The operation is as follows:—As the outer end *a*, of the key is being depressed to produce a note, its inner end *b*, is raised, and with it the piece *c*, which, by the hook *d*, draws up the tail piece *f*, and causes the hammer to strike with a quick blow upon the strings; at the same time the damper D, is raised from the string by the hook *y*, drawing up the lever *l*. The further depression of the key, while the note is sounding, brings the piece *c*, into contact with an adjustable pin or stop *i*, by which its further upward movement is arrested; but, as the end *b*, of the key continues to rise, (see fig. 9,) it causes the piece *c*, to move on the pin *i*, as a fulcrum, which causes the hook *d*, to move along the notch *e*, whereby the tail piece *f*, becomes depressed, raising the hammer from the string, and leaving it free to vibrate; the damper being kept elevated until the finger is removed from the key. By these means the hammer is removed from the string the moment after the note is struck, that is, the instant the piece *c*, touches the pin *i*, the further upward motion of the end *b*, of the key carrying the hammer further from the string. On the finger of the performer being removed from the key, its inner end *b*, immediately falls by its own gravity, and with it the damper, into the position shown at fig. 8, the hammer, at that time, being kept from the string by a spring *m*, forcing out the piece *c*; and also by the connexion of the notch *e*, and hook *d*.

The operation of the pedal to produce piano and crescendo is as follows:—The bar or ledge *k*, which carries the dampers and the rests for the keys, extends across the piano-forte, and is affixed to the ends of two levers *n*, (one on each side of the instrument) having their fulcrums at the side of the key box in a line with, or opposite to, the dampers. The rod *v*, leads from the pedal; and, on the foot piece being depressed, this rod rises and carries up the ledge *k*, with the key A, the piece *c*, the hook *d*, and the tail piece *f*, of the hammer; which movement depresses the hammer and brings it nearer to the strings, produces the "piano," and thereby shortens its action. The jointed end of the lever *l*, is at this time raised with the bar *k*, the damper D, remaining upon the strings. It will be seen that this operation of the pedal limits the movements of the keys and hammers, without interfering with the freedom of their action; and that, as the extent of the movement of the hammer is increased from "piano," "crescendo" will be produced.

The operation of the pedal to produce forte and de crescendo, is communicated through the rod *u*, which raises one end of the lever *r*, and with it the lever *l*, and the damper off the strings, the other end of the lever *r*, being jointed to the ledge *k*.

Fig. 10, is a side elevation of a key and mechanism of the other novel arrangement, construction, or combination of the parts of the action of a piano-forte represented in the quiescent state. Fig. 11, shows the hammer discharged or removed from the string after the note has been produced, and the string is left free to vibrate. In this arrangement, the discharge or escape of the hammer is effected by the falling of a part of the key, which is composed of two pieces, jointed one to the other, and connected together, while in the act of striking a note, by catches, which are released immediately after the note has been struck; the one part of the key falling away from the other, and producing the escape of the hammer: A, is the key; B, the hammer; C, the string; D, the damper. The key A, is composed of two parts, *a*, and *b*, connected together at *c*, by a flexible joint; *d*, and *d**, are the catches or hooks, which take one into the other, and connect the parts of the key so as to form one continuous lever, as shown in fig. 10. On the key being depressed in the act of producing a note, the end *b*, of the key is raised, which, by means of the hook *e*, draws up the tail piece *f*, and causes the hammer to descend on to the string. On the piece *d**, coming in contact with the end of the damper lever *n*, that end of the lever is raised, and the reverse end depressed, which, through the rod *p*, acts upon the lever *q*, and raises the damper off the strings. The further depression of the key raises the projecting stud or pin *i*, of the hook piece *d*, against the under side of the ledge *k*, which arrests its progress, and disengages the catches *d*, and *d**, from each other, as shown in fig. 11. The inner end of the part *b*, of the key being thus disengaged from the part *a*, immediately falls, and causes the hook *e*, to return the hammer to its former position, as shown; the damper being kept elevated during the time the note is sounding. On the removal of the finger from the key, the parts immediately fall into the quiescent position, as in fig. 10, the hooks *d*, and *d**, being made to take into each other as they come together, by means of the spring *m*.

The operation of the pedal upon this construction of action to produce piano or crescendo, is as follows:—On the foot piece being depressed, the rod *w*, rises, and with it the shorter ends of two levers *l*, (one on each side of the instrument,) which levers turn on fulcrums placed in a line with those of the hammers at *h*; the longer ends of the levers *l*, are depressed, carrying with them the piece *v*, and the stop or adjusting pieces *u*, which limit the movements of the hammers; and it will be perceived that as the rod *w*, is raised by the pedal more or less, so will the extent of movements of the hammers be limited or extended. When the shorter ends of the levers *l*, are raised, they carry with them the rods *x*, which are connected to the moveable piece *y*, carrying the fulcrums *o*, of the damper levers *n*; which moveable piece is jointed to the ledge *k*, at *z*. This arrangement allows the fulcrums of the levers *n*, to be raised a little, while the movement of the keys and hammers are limited, so as not to remove the dampers off the strings, all parts having their proper action, though contracted in extent. The action of the pedal to produce forte or de crescendo, is effected by raising the rod *u*, which carries with it the fulcrum *r*, lever *q*, and lifts the damper off the strings. I would here remark, that parts of the keys must be properly weighted, to assist the action, which I propose to do by running lead into the keys at the parts marked * in the figures. The box or case E, E, containing the keys and action, is connected to the instrument by hinge joints F, coincident with the line where the hammers strike the strings. When it is desired to get at the pegs or strings for the purpose of tuning or replacing them, the box or case is to be raised upon the hinge joints, and held up by a stick or stretcher, which movement does take the hammers out of their proper place of action on the strings; the tuner can then use one hand to strike the keys, and the other to tune the strings.

The second feature of these improvements in piano-fortes, viz. the novel construction of sounding board, is exhibited in figs. 12, and 13. The board is constructed according to the principle of vibrating staves, which are fastened at one end only, and free to vibrate throughout their whole extent. It consists of an upper and under horizontal slab or plate, formed by staves of pine or other suitable wood, united at their edges, their fibres running in the direction of the staves; and the compound parts of the boards, that is, the staves, should respectively answer in their vibrating action and tone with the strings severally extended over them, in order to produce, by their vibration, similar or corresponding sounds. Fig. 12, is a horizontal view of the upper surface of the improved sounding board, as adapted for a horizontal grand piano-forte. Fig. 13, is an edge view of the sounding board as seen on its curved side. The staves composing the sounding boards are properly fastened and secured to the peg board of the instrument in the line *a, a, a*; from this line to the extremity *b, b, b*, the board is free to vibrate; its thickness at the base may be as usual, but the treble part should be reduced to about a quarter of the thickness of the base; *c, c, c*, is the bridge, which, by this improved construction, may be situated nearer to the extremity than formerly. The dotted lines *d, d, d*, show the position of the ribs extending along the under-side of the top sounding board; which ribs are also constructed as vibrating staves, and are placed in the direction in which the fibres of the staves run, in order that all the fibres may vibrate together, and be considered to form part of each vibrating stave; between the ribs a sound hole is cut of the *f*, shape, like that of a violin, which severs the fibres of the wood between the ribs: *e, e, e*, represent the strings; the ribs of the lower sounding board correspond with those on the upper one, by which the air between the two boards is divided into volumes corresponding to the staves, by which their sounds are made to reverberate. The two boards are connected together by the sound posts *g, g*, placed round the curved edge opposite the ends of the ribs of the sounding board, and communicate the vibration of the upper to the lower board, and answer in effect and purpose to the sound post of a violin: they may be strengthened, if thought necessary, by a band of veneer or other wood extended along the curved edges of the board at top and bottom of the posts; *h*, is the part of the board answering to the bass, and *i*, that of the treble. It will, of course, be understood that the shape of this improved sounding board must depend on the kind of instrument intended to be made, therefore it will not be necessary for me to show all the forms in which it is capable of being constructed. Fig. 14, represents the figure of a sounding board adapted for a square piano-forte, having an upward beating action of the hammers: in this arrangement, the keys can be placed in the centre of the instrument, instead of on one side, as in common.

I would here remark, that what I consider the peculiar novel feature of this improved construction of sounding board is, as before stated, that the vibration of all the parts, or what may be called the staves, answer or correspond to the sound produced by the strings passing over them; and that all parts of this improved sounding board is free to vibrate from the line *a*, *a*, *a*, it not being allowed to touch the instrument or its case in any other part.

And further, I would remark, that I do not mean or intend to confine myself to the precise form of the various parts shown in the drawings, and described in this specification, as they must, of course, be varied to suit different kinds of piano-fortes, either of the upright or horizontal construction.—[*Inrolled in the Rolls Chapel Office, August,* 1836.]

Specification drawn by Messrs. Newton and Berry.

To JOHN SPRINGALL, *of Oulton, in the county of Suffolk, iron founder, and* ROBERT RANSOME, *of Ipswich, in the same county, iron founder, for their invention of an improved mode of manufacturing certain parts of ploughs.*—[Sealed 2nd November, 1835.]

THIS invention is described as consisting in forming the ploughshare, or the wing or blade, or whatever that part of the plough may be called which makes the horizontal cut in the land, of *wrought iron or steel*, either or both stamped or pressed, or partly stamped or pressed, and partly hammered into the various forms required.

Plate VII., fig. 1, represents a plough, having the share, wing, or blade shown attached thereto at A; the remaining figures show the share detached, and the apparatus for preparing it. Fig. 2, is a blank or thin flat piece of iron or steel, (say about one-eighth of an inch thick,) shaped as here shown, by any ordinary means before it is stamped. Fig. 3, is the plan of one of the faces of this same piece of metal after it has been stamped in dies into the form here shown, and thus formed into a blade; *a*, *a*, *a*, being a rib, turned up at the land side of the blade to give strength to it; and *e*, *e*, *e*, a concave arc stamped in the blade, in order to raise a convex arc on the opposite side, which serves as a shoulder for the chaps to butt against, while it adds strength to the blade. Fig. 4, is a plan of the opposite face of the same blade, showing the convex side of the arc *e*, *e*, *e*; and fig. 5, is a perspective view of the blade, showing more clearly than could be shown in the plan, the side rib *a*, *a*, *a*, turned up by the stamp, as has been before described, in order to give strength to the land side of the blade. Fig. 6, is a blade stamped out of another shaped blank, the edges of which are afterwards to be drawn out, under tilt or other hammers, to the shape shown by the dotted lines : in this latter case the blank should be somewhat thicker than when the edge is formed at once in the dies. Fig. 7, is a plan of the matrix or lower and stationary die; and fig. 8, a view of the stamping or upper die used to form the blade hereinbefore described at fig. 3, the face or underside of the upper die, presenting exactly the same surface as that shown at fig. 4, which is here supposed to have been created by it. Fig. 9, is an end view of fig. 7, showing the rise or raised side of the die which forms the side rib on the blade. Fig. 10, is a section of the top and bottom die in the position of pressing or stamping the blank; the letters *f*, *f*, representing the blank, which should, in all cases, be made red hot, for the operations of stamping or pressing, the dotted line represents the side rib : *r*, is a key slot to fix the die in the fly press shown at fig. 11, where the dies are shown in the position they would be when ready to receive a blank. Fig. 12, represents a pair of rollers, between which a blank may be pressed into the form required for a blade, instead of being stamped as represented in the fly press. Fig. 13, is the shaped blank required for making a ploughshare by stamping or rolling, it differs only from the plough blade, by having a shank or socket, commonly called a box in the trade, added to, or rather made one with it, and may be made precisely in the same manner as the blade, the different shape being obtained by the difference in the shape only of the blank and of the dies. Fig. 14, is a perspective view of the upper side of the share; and fig. 15, a perspective view of the underside of the share. Fig. 16, is the upper, and fig. 17, the lower die, for making the share just described. In the drawing, fig. 18, represents another shaped blank for making a ploughshare by stamping or rolling in dies; in which share the box is made four-sided, and the blade of double thickness: this blank must first be placed in the dies shown at figs. 20, and 21, of which 20, is the under, and 21, the upper die, and stamped, while red hot, into the shape shown at fig. 19; the two sides are then to be folded over as shown at fig. 22; and the two wings welded together in the ordinary way, when it will assume the appearance shown at fig. 23: the share must then be heated again red hot, the plug, fig. 24, must be forced into the box, and the share placed in the lower die of another pair of dies, as shown at fig. 25, with the plug in the box; and it should here be noticed, that the outer end of the shank or handle of the plug is narrower than the inner end, so that the blow from the upper die, which should now be given, may not force it out when the operation of stamping is performed. Fig. 26, is the upper die of fig. 25; and fig. 27, is the ploughshare complete after it leaves the dies.

Having found, from experience, that the said shares and blades, when made of steel, and formed by stamping or pressing, are apt to break or split in the dies or rollers, we have, in many instances, adopted the plan of making the share or blade complete, entirely of wrought iron, first, and afterwards subjecting the manufactured article, in its complete state, to the process of converting iron into steel, which we have found highly advantageous, inasmuch as it gives us every facility required for shaping the metal in the dies, while it is enabled to obtain a temper in the article for use, which is of the greatest importance in some cases to the plough.

The Patentees say, in conclusion, " Now, whereas we claim, as our invention, the manufacturing of ploughshares and blades, or wings, or whatever that part of the plough may be called, which makes the horizontal cut in the land in the work called ploughing, as before described, of wrought iron or steel, either or both, stamped or pressed into the form required, by means of dies and presses, or stamps, or by rollers, or any the like suitable machinery. And we further claim, forming the said shares and blades, or wings, complete of wrought iron only, and then subjecting them, in their finished state, to such known processes as will convert the iron of which they are made into steel."—[*Inrolled in the Inrolment Office, May,* 1836.]

To JOHN ASHDOWNE, *of Tunbridge, in the county of Kent, gentleman, for his invention of improvements in apparatus to be added to wheels, to facilitate the draft of carriages on turnpike and common roads.*—[Sealed 13th May, 1836.]

THE Patentee describes his invention as consisting of a certain apparatus to be attached to the wheels of waggons, carts, coaches, and other carriages, whereby the friction of such wheels is materially reduced, and, consequently, rendering the draft considerably easier.

The novel apparatus consists of an endless chain, or what may be called a portable railway, placed round the periphery of the wheels, and made somewhat larger than the outer circumference of the said wheels; so that, as the wheel revolves, the endless chain may always present a hard and solid surface for the wheel to run upon, as will be hereafter described.

Fig. 28, Plate VII., represents the side of a cart, with the apparatus attached to the wheel: *a, a*, being the felloe of the wheel, and *b, b*, the endless chain or railway which is passed round the same; *c, c*, is a lever, extending from the axle, and is supported by an arm *d*, which is attached to the cart: *e, e, e*, are guards or guides, which are affixed to the body of the cart, and are for the purpose of preventing the endless chain from getting off the periphery of the wheel. It will now be seen, that as the wheel revolves, the endless chain will pass over the expanded end *f*, of the lever *c, c*, and will thus present to the wheels a hard and solid surface, similar to a railroad. It may here be observed, that this apparatus is attached to both the wheels, and in a similar manner.

The Patentee says, in conclusion, that he does not mean or intend to claim the construction of the endless chain, or any other of the parts separately; but what he does claim, is the precise arrangement of apparatus herein shown, for the purpose of reducing the friction or draught of wheels on turnpike and common roads.—[*Inrolled in the Inrolment Office, November*, 1836.]

To WILLIAM GODFREY KNELLER, *of Hackney, in the county of Middlesex, Esq., for his invention of certain improvements on stills and apparatus for distilling.*—[Sealed 29th June, 1831.]

THIS is an apparatus to be introduced into a still-head, for the purpose of rectifying the alcoholic vapours emitted from the still below.

The apparatus is shown in section, in Plate VII., at fig. 29, consisting of a series of cylindrical vessels, placed concentrically one within another. A very brief description of this figure will render the invention obvious.

Part of the vessel, in which the wash is placed for distillation, is represented at *a*, *a*; upon the top of this, a cylindrical vessel *b*, *b*, is affixed, by flanges bolted thereto. Within this vessel, several other cylindrical vessels, as *c*, *c*, *d*, *d*, *e*, *e*, *f*, *f*, *g*, *g*, and *h*, *h*, are fixed, each being attached, by its broad flange, to the outer vessel *b*, *b*, at *i*, *i*.

The cylindrical vessels *c*, *e*, and *g*, have bottoms; the other cylinders are open at their lower ends. A small quantity of water is to be introduced at the man-hole above, from whence it flows down into the vessel *g*, and from thence passes off, by a small hole in the side, in the vessel *e*, and thence into *c*. By these means, a few inches of water is left at the bottom of each vessel, for the purpose of taking up any empyreumatic matter which may happen to come over with the spirit; and the superfluous water flows away through the small holes into the still.

The operation of the rectifying apparatus will be this: the alcoholic vapour, as it rises from the still, passes up between the outer cylinder *b*, and the vessel *c*, as shown by the arrows; at the top of this vessel it proceeds through small openings to the interior vessel *c*, and descends between it and the cylinder *d*, into the water at bottom. After passing through the water, the spirituous vapour rises within the cylinder *d*, and at top passes into the vessel *e*, and so on, until it at length rises in the cylinder *h*, and passes off in the ordinary way to the refrigerating worm.

The Patentee claims the "*congeries of tubes*," applied in the way shown, to a still, whether such tubes be cylindrical or of any other suitable form; and whether they are placed erect, as shown, or in any other position.—[*Inrolled in the Inrolment Office, December,* 1831.]

To THOMAS EDGE, *of Great Peter-street, in the parish of St. John the Evangelist, in the city of Westminster, gas apparatus and lamp manufacturer, for certain improvements in lighting or illuminating by gas, oil, or spirit lights, or lamps, being partly a communication from a foreigner residing abroad.*—[Sealed 28th October, 1836.]

THESE improvements in "lighting or illuminating by gas, or other lights or lamps," apply to the mode or method of lighting or illuminating shop-fronts, show-glasses, and other situations, by external lights and reflectors; and more particularly apply to lighting or illuminating by means of *gas lights* placed on the outside of shop-fronts or windows, or on the outside of glazed show-cases, containing goods requiring to be kept from the external atmosphere, and the injurious effects of deleterious vapours arising from the combustion of gas; and consists, in the first instance, in lighting or illuminating by means of *external gas lights, lanterns, and reflectors, applied, fitted and used, in the manner hereinafter more particularly described;* and secondly, in *the same improved mode of applying and fitting external oil or spirit lamps and reflectors.* And I would here remark, that I am aware that oil and spirit lamps have been heretofore used for externally illuminating shop fronts and such other situations; but they have been applied with fixed and stationary brackets, suspenders, and fittings, whereas the object of these improvements, as regards illuminating by *these means*, is to adapt, fit, and use external lamps in such manner that they may be easily taken away in the day time, or when not required, and all appearance of the lamps, and the obstructions they would otherwise offer to the full exposure of the shop front be removed, at the same time they can be easily and readily applied when wanted. And these improvements in the mode of illuminating by means of *gas lights* and reflectors have the same object; and further, the removal of the gas and vapours arising from its combustion, from within the shop window or show-case, in order that the goods may not be subject to the deleterious effects arising therefrom, whereby the articles exposed to view will not require to be moved or re-arranged to suit the difference of the illumination by day or night, which is more particularly desirable with drapers' goods, lace, jewellery, silks, or woollen manufactures, all of which are liable to be injured by the gas escaping, either from the carelessness of the persons who apply and remove the lights and their fittings, or from the imperfections in the fittings themselves, the only moveable part of the fittings, in this improved mode of applying gas lights and their connexions with the stationary supply pipe, being on the outside of the window; and the escape of gas (if any) will be to the atmosphere, by which means, the vapour arising from the combustion of the gas will also be prevented from coming into contact with the goods. And further, these improvements have for their object, the preventing, as much as possible, the escape or wasting of the gas, the time of applying and removing the lights, and further, in protecting the fittings or joints which connect the brackets or suspenders to the end of the stationary supply pipe by day, from the action of the atmosphere upon the interior of such joints or fittings, which would otherwise soon corrode, and form an imperfect junction between the supply pipe and the passage to the burner.

The several figures of the accompanying Plate will serve to illustrate these improvements, and the manner of carrying the same into effect, although I do not mean or intend to confine myself to the precise forms or arrangement therein shown and described, as a great variety of designs, shapes, or patterns, and the mode of fitting or applying the same may be used to suit the tastes of different persons, or the circumstances of the case, without departing from the principal and necessary features of these improvements.

Fig. 1, Plate VIII., is a side representation of an external gas light and lantern, as applied to a shop window, receiving its gas from the end of a branch on the supply pipe in front of the fascia of the shop window; fig. 2, is a section taken through the lantern; fig. 3, is a side view of a similar lantern, as applied and fitted to the underside of the fascia of the shop front; figs. 4, 5, 6, 7, and 8, are partial detached views and sections of the fittings next the fascia, of the window, drawn on an enlarged scale: *a*, is the end of the fixed or stationary supply pipe, or a branch therefrom, which terminates in the conical socket or projecting part *b*, fixed on to the fascia of the shop front; this part is supplied with a stop cock *c*, to allow the gas being shut off or let on at pleasure; or, instead of these cocks, one cock, placed on the main supply pipe, may be used; *d*, *d*, is the hollow bracket or suspender, one end of which terminates in the conical cock plug *e*, fitting into the conical hollow of the part *b*; this conical plug is also hollow, and has small holes pierced through its sides to form a passage-way or communication to the interior of the branch *d*. The lantern *f*, is glazed on its front and sides, and the back part is formed of proper shaped reflectors *g*, *g*. The gas enters from the branch *d*, to the burner *i*, by the short pipe *h*, which is furnished with a cock at *k*, to regulate the light; *m*, is the ventilating chimney of the lantern; *n*, is the door for cleaning the inside of the glass, and removing the chimney of the burner. It will be seen, by the drawing, that the whole of the lantern and the suspending branch can be removed by lifting the plug *e*, out of the joint *b*, and can be as easily applied, by placing the plug in the hollow socket, the weight of the lantern keeping the joint tight. In order to protect this joint from the action of the atmosphere when the light is not in use, a solid conical plug *o*, shown detached in fig. 9, is introduced into the hollow of the part *b*, as shown in side and front views, figs. 7, and 8. The lantern is attached to the suspending bracket or branch by means of hooks or proper fastenings fitting into sockets at *p*, on the branch pipe *d*, and also by other forks or pins taking into sockets at *q*. By these connexions, the lantern can be easily removed from, or attached to, the branch *d*, as required.

When the lantern is applied as shown in fig. 3, a screw nut, as at *r*, is required to keep the plug *e*, tight in the joint *b*, which screw nut must be removed previous to taking down the lantern. A similar plug to fig. 9, is to be introduced when the lantern is not in use. Fig. 10, shows another variation of this mode of applying gas lights, with a suspending bracket projecting a greater distance from the fascia of the window, which may be desirable where the light is required to be thrown more generally over the goods exposed to view, the same letters being marked upon corresponding parts, no further description will be required.

Having now particularly described this improved mode of lighting or illuminating by gas lights, and the methods of fitting and using the same, I would remark that the lantern may be placed at an angle to the shop front, or parallel thereto, as best suits the circumstances of the case; and, in order to effect this, a joint may be made in the lower part of the branch *d*, or at its connexion with the pipe *h*, to allow of the lantern being turned about in order to throw the light upon the part required; and also that the vertical part of the suspending branch or bracket may be supplied with a telescopic joint, sliding up and down, by which means the height of the lantern may be regulated at pleasure: all of which modifications of applying the external lights are susceptible of variation, and it is therefore not necessary for me to particularly describe them.

Another mode or manner of applying, fitting, and using the external lights is shown in fig. 11, of the accompanying drawing, and, in some cases, may be preferred to the foregoing. In this instance, the lantern is attached to, and supported by, the framing of the window or sash; and the branch supply pipe is carried upwards or downwards inside of the window, close to the framing of the sash, and terminates on the outside, opposite the situation of the lantern, in a small ornamented plug or nozzel, to which a short moveable branch pipe is connected to conduct the gas to the burner, situated on its end within the lantern; the same letters of reference are marked on the same or corresponding parts, as in the former figures: *a*, is the supply pipe, shown by dots, placed behind the sash framing; *b*, is the joint or connexion with the small branch *h*, having the hollow plug *e*, at one end, and the burner at the other. The lantern is supported by the arms *s*, *s*, attached to the sash frame by small turn buttons or screws at *t*, *t*; and *u*, *u*, are legs, the ends of which fit into small sockets *v*, *v*, on the lower sash bar. To apply this lantern, the solid plug is first taken out of the part *b*, and the small horizontal branch applied thereto; the lantern is then placed upon the burner, and secured by turning the buttons or screws *t*, *t*, on to the arms *s*, *s*, when it will be firmly secured to the sash. When it is to be taken away, the lantern is first to be removed, and then the small horizontal branch and burner.

In conclusion, the Patentee remarks, that " having particularly described these improvements as applied to the external gas lights, I pursue the same mode of fitting and applying the external oil or spirit lamps ; but, in this case, there is no necessity of using the cocks, hollow branches, tubes, or pipes; but I apply, suspend, and fit the lamps by similar means from the fascia or other part of the shop front, and also from the connexions, so that the lamp shall be capable of adjustment as to height, and the direction in which the light is reflected by means of the joints above mentioned, the reservoir for the oil or spirit being placed on the end of the suspending branch, or in any convenient situation.

" And I claim as the invention secured to me by the above in part recited Letters Patent, *the mode or method of applying, fitting, and using external gas lights hereinbefore mentioned*, by which they can be applied, adjusted, and removed as required, with ease and facility; at the same time, the joint or fitting between the supply pipe and branch or bracket, is protected, when the lamp is not in use, by means of the plug, as before described ; and also, I claim the mode or manner of applying, fitting, and using oil or spirit lamps in the way *herein particularly described*, without claiming the broad principle of applying such external lamps for the purpose of outside illumination."—[*Inrolled in the Rolls Chapel Office, May*, 1837.]

Specification drawn by Messrs. Newton and Berry.

To WILLIAM WRIGHT, *of Salford, in the county of Lancaster, machine maker, for his invention of certain improvements in twisting-machinery, used in the preparation, spinning, or twisting of cotton, flax, silk, wool, hemp, and other fibrous substances.*—[Sealed 20th June, 1836.]

THE Patentee describes his improvements as consisting in the construction and application of an elastic medium or support to the collar or bolster in which the spindles of twisting machinery revolve, whereby the vibration of such spindles is materially decreased when running at high velocities, together with various other improvements in the construction of twisting machinery, for the purpose of increasing the speed and decreasing the weight of the spindles used in such machinery, as well as improving the drag or taking up motion, and effecting various other improvements as hereinafter described; and the manner in which the same is to be performed and carried into effect, will be seen by reference to the annexed drawings and the following description. The same letters and figures of reference are used to indicate the same parts throughout the whole of the figures.

Fig. 1, Plate IX., represents a front view, and fig. 2, an end view, of part of an ordinary throstle, delineated for the purpose of showing the position in which some of my improvements are applied to such machines. In these figures, A, represents the driving shaft, provided with fast and loose pulleys, and B, the drum, from which rotary motion is imparted to the spindles C, C, C, C, by means of bands in the ordinary manner; D, are the drawing rollers, and E, the creel, containing the rovings. It will be remarked that the spindles represented in the figures are much smaller than those of ordinary throstles, and the step-rail *g*, *g*, and bolster-rail *d*, *d*, much nearer to each other.

"The first part of my improvements, which I shall now proceed to describe, is represented at fig. 3, and a sectional elevation at fig. 4, and consists of an elastic medium or support, as seen at *f*, for the bolster or collar in which the spindle revolves: *a*, represents a brass tube, bolster, or collar, through which the spindle passes. This brass collar or bolster is supported in the elastic washer of leather *f*, which fits into a small groove cut in the horizontal flange of the bolster or collar *a*, as seen at fig. 4; and the exterior of the round washer of leather *f*, *f*, rests in a countersunk hole on the bolster-rail *d*, *d*, where it is held fast by means of the metallic ring or loop *e*, *e*, which fits firmly into the countersunk hole in the rail, and holds the leather washer *f*, *f*, firm in its proper position. Through the bolster or collar *a*, the spindle is passed in the ordinary manner; and it is by means of the partial elasticity of the leather washer *f*, *f*, that I am enabled to run spindles, supported in this manner, at an increased speed, without materially increasing the vibration; and, in experience, I find that I can run ordinary throstle spindles, supported by this improved arrangement, at a speed considerably faster than spindles supported in the ordinary manner, without any material increase of vibration.

"The second improvement which is generally used along with the elastic medium for supporting the bolster or collar, is the hooded warves, as shown in section at fig. 5. In this figure, *g*, *g*, is the step-rail supporting the ordinary brass in which the foot of the spindle c, is placed, and covered by the hooded warve as there represented. By this arrangement of the driving warve, the step or lower support of the spindle is kept free from dust or waste; at the same time that the driving band, being nearer the point on which the foot or end of the spindle is supported, causes less vibration. This arrangement of the driving warve may be further modified by substituting a brass, constructed as shown at fig. 6, in which the upper part of the brass is slightly contracted to act as a collar or support to the part of the spindle marked *h*, when placed in it, so that the bearing of the spindle, when placed in the brass, rests between the lower extremity or foot at *i*, and the collar at *h*; while the position of the hooded warve causes the tension of the band, by which it is driven, to act in an intermediate position between the two bearings *h*, and *i*; at the same time that it acts as a covering and protection to the step or brass in which the spindle revolves. This modification of my second improvement also enables me to dispense with the support of the ordinary bolster rail altogether, when it may be desirable so to do.

"The third improvement consists in the application of a metallic disc to the top of the spindle, as represented at fig. 7, and separate in plan at fig. 8, which may either be attached to the flyer or not, the effect being in both cases the same; namely, the steadying the spindle in the revolution by the increased inertia caused by the additional weight of the disc K, K. Another modification of this improvement is shown at fig. 9, which represents an arrangement of spindles suitable for spinning pin cops. In this figure, the disc K, K, is moveable; and the parallel arms, which represent the flyer, fit into openings in the disc K, as there represented. On one of these arms is placed the forked piece *x*, which slides freely up and down, but is held stationary as regards the perpendicular traverse of the cop, by means of the stationary ring *x*', which is represented in plan above this figure, so that the copping motion of the spindle distributes the yarn regularly on the surface of the pin cop.

"The fourth improvement consists in applying the drag to the flyer instead of the bobbin, and is represented in fig. 10, in which improvement the bobbin is supported fast on the spindle, and the flyer resting free on the copping rail, effects the drag or winding on by the friction of the surface on which it rests. The flyer, in this improvement, is provided with a small tube, through which the spindle passes, and thereby assists in steadying it. This tube, which is shown at *o'*, *o'*, proceeds up the interior of a sheath *a'*, *a'*, which latter carries the bobbin *c*, is identified with the spindle above the imaginary line *b'*, *b'*; by which arrangement, I am enabled to effect a given amount of copping motion with a shorter spindle."

Having enumerated and described four of the separate improvements, the Patentee here states, that they may be used either separately or together, as circumstances may require, according to the nature of the twisting machinery to which they are to be applied, all which must depend on the nature of the twisting machinery to which such improvements are to be applied; and the application of the two first improvements are sufficiently set forth and described, as regards the ordinary throstle, at figs. 1, and 2, to enable persons, conversant with machinery of this nature, to apply any one or more of the improvements to the various arrangements of twisting machinery where such may be required.

"The fifth improvement in twisting machinery consists in a new arrangement of parts for the purpose of manufacturing cordage of hemp, flax, or other similar material, in a more compact and uniform manner than at present performed by the ordinary machines used for that purpose. Fig. 14, represents a front view of part of a preparation machine for twisting the raw material into a thread or strand. In this figure, Q, represents a series of revolving or twisting tubes, similar to those in common use in the cotton preparation machine, called Dyer's frame, into one end of which the hemp or flax is supplied by hand from the back of the machine at B; from the opposite end of these tubes it proceeds to a set of drawing rollers D, where it is drawn down and elongated, according to the draft required for the material under operation. From this point it proceeds forward, and is spun into a thread by means of the revolving spindles C, C, and finally deposited on the bobbins O, O. These bobbins are also geared together by the wheels *p*, and *q*, to equalise their revolutions, and thereby equalise the amount received on to each bobbin, while the spindle receives the rotation by bevel gearing from the front drawing rollers. As soon as the bobbins *o*, are filled by the machine, they are removed, and three or more are placed loose on the spindles C, C, as seen at fig. 15, where they partake of a twofold motion, one around the centres of the spindles in a direction to unwind or give off the yarn or strand which they contain, and the other around the centre of the shaft S, at the upper extremity of which the strands are gathered together; and by its rotation, formed into a rope or cord, which is received, in a finished state, on a revolving cylinder T, the rotation of which keeps it in a state of tension, and delivers it, as it is completed, at the point *u*. This machine is driven by the pulley A, which imparts the taking-up motion to the cylinder T, placed on the same shaft, and also an equal motion to the two perpendicular shafts V, and W, by means of bevels at their upper extremity. The shaft W, imparts motion to the shaft *s*, by means of the spur wheel X, and Y, at the same time that the upright shaft V, drives the spindles C, C, by the spur wheel Z, *r*, *s*, the latter of which gears into the pinions *t*, *t*, which are fast to the spindles, while the wheels *r*, and *s*, are fast on the collar *u*, which moves freely on the shaft s. The arms for supporting the spindles C, C, are represented at *n, n*; and *m*, is a spur wheel gearing into each of the small wheels on which the bobbin is supported, and thereby equalising their rotation, and the consequent giving off of each strand, which is ultimately to form the rope or cord on the cylinder T, as there represented.

" The sixth and last improvement consists in a new arrangement for producing the drag or retarding actions on the bobbins of every description of doubling machine, but peculiarly so to machines used in the manufacture of heald yarn, in which it is essential that every strand of which the yarn is composed should be of equal length, and sustain an equal tension. Fig. 11, represents a front, and fig. 12, an end view of part of the doubling machine for twisting together yarn for the purpose of forming a three-fold strand, to be afterwards used as one of the strands of the heald yarns to be manufactured. In these figures, E, is the creel, containing the bobbins of yarn to be doubled; D, the rollers through which the ends are passed; and *o, o*, the bobbins on which they are received in a doubled state. The spindles which impart the twist in this machine, are driven in the ordinary manner by wheels or bands, the bobbins *o, o*, being severally placed on the face of small spur wheels *p, p*, to which they are attached by means of a small stud or pin, so as to carry each wheel *p*, in the same direction as the respective spindles. Intermediate, or between each spur wheel *p*, is placed a carrier wheel *q*, supported on a fixed stud, which gears into the spur wheel *p*, the speed of rotation of each bobbin *o*, is necessarily alike and equal. The last of these carrier wheels *q*, (at one extremity of the frame,) is placed on a short spindle, the lower part of which is provided with a screw or worm, taking into the worm wheel O, to which it imparts a slow rotation on its centre from the rotation of the bobbin *o*, *o*. This rotation is impeded by the weight H, the amount of which determines the resistance or drag of the bobbin by means of the helical scroll or spiral on the face of the wheel G, on which the weight H, is supported. This helical scroll or spiral is so calculated, as to elevate the weight H, near to the centre of the wheel G, as soon as the bobbin *o*, shall have received the proper quantity of doubled yarn, which, as before stated, is necessarily equal, from each bobbin having performed an equal number of revolutions. In this state the bobbins *o*, are removed to a similar machine, an end view of which is shown at fig. 13, in which three strands of the bobbin *o*, are twisted or doubled in a reverse direction to the former twisting, and finally from the heald yarn on the bobbin P.

"In this machine, the bobbin *o*, as well as the bobbins P, are equalised and governed in their rotation by a similar apparatus to that already described at fig. 11; so that an exact quantity is given off from each bobbin *o*, and an exact quantity taken up or doubled on to each bobbin P, the tension on every strand remaining uniformly alike on every part throughout the whole operation. Another modification of the means of applying the weight H, as a drag to the bobbins of twisting machinery, and one which is more applicable to spinning machinery, is represented in side view at fig. 16, where, instead of gearing the bobbins together by means of the spur wheels *p*, and *q*, as already described at fig. 11, the bobbins are severally supported on a series of warves *w*, provided with bands, which pass round the drum or cylinder *x*, the retarding motion of which is governed or actuated by a worm on its axis, taking into the worm wheel G, provided with weight H, as in the former arrangement, represented and described at fig. 11."

The Patentee says, in conclusion, "Having now described my certain improvements, together with the mode of application to the twisting machinery known as the throstle frame, the application of such improvements, either separately or combinedly, to other twisting machinery, will be sufficiently obvious to persons conversant with machinery of this nature. And, although I have, in the above specification, described several well-known parts of ordinary machinery to render the application of my improvements better understood; I do not claim any such well-known parts, but what I do claim in my first improvement in twisting machinery is the application of an elastic support or medium to the collars or bolsters in which the spindles revolve as represented at *f*, figs. 3, and 4, which support or medium may be applied in various ways, and be constructed of leather, as there represented, or of other suitable elastic substance, the elasticity of which materially decreases the vibration of the spindles when running at high velocities. And, as regards my second, third, fourth, and fifth improvements, I claim the general arrangement and application of such improvements as there set forth and described to twisting machinery. In my sixth and last improvement, I claim the application of one uniform weight for equalising the drag or taking-up motion on the whole of the bobbins used in any one machine, as well as the application of the same improvement for regulating the giving-off motion of any number of bobbins used for supplying the material to the drawing rollers; the action of such retarding weight being conveyed to the various bobbins by the means hereinbefore described, or any modification thereof; and all such improvements being, to the best of my knowledge and belief, entirely new, and never before used in England, Wales, and the town of Berwick-upon-Tweed aforesaid, I do hereby declare this to be my specification of the same, and that I do verily believe this, my specification, doth comply in all respects, fully and without reserve or disguise, with the proviso in the said hereinbefore in part recited Letters Patent contained, wherefore I do claim exclusive right and privilege to the said invention.—[*Inrolled in the Inrolment Office,* 1836.]

To SAMUEL TONKIN JONES, *of Manchester, in the county-palatine of Lancaster, merchant, for his invention of certain improvements in the tanning of hides and skins.*—[Sealed 4th October, 1836.]

THESE improvements in the tanning of hides and skins consist in a peculiar method of effecting the process of tanning in a more perfect manner, and in a much less time, than has hitherto been effected; and consists, firstly, in the application of certain substances to the surfaces of hides or skins under operation, which substances shall be capable of draining or absorbing, as well as retaining liquors for the purposes of either draining, absorbing, or injecting, as may be required; and, secondly, in submitting the skins or hides either singly or collectively, and in combination with the said drainers, absorbers, and injectors (as shall be hereafter more fully described), to any well-known mechanical pressure, and thus to cause a more rapid and effectual dislodgment of the "spent liquor," or that aqueous fluid which is contained in the body of the hide or skin, after the usual immersion in the tanning liquor, while the colouring or tanning matter which has been taken up by the surfaces of the skin, shall be more quickly supplied, and absorbed simultaneously with the slodgment or ejection of the spent liquor. But in order t my improvements may be more perfectly understood, it may be better first to advert to the usual mode of conducting the process of tanning. The hides or skins, after having been cleansed from hairs, grease, and other extraneous matter, and prepared for the pit in the usual manner, are immersed in the tanning liquor; which, by pressing equally in all directions, unites the colouring matter or tanning principle with the skins first at or near the surfaces, and while the colouring or tanning matter is taken up or absorbed by the outsides or surfaces, the spent liquor, or that which has lost its tanning effect, has proceeded into the middle or body of the skin. The usual method of dislodging or getting rid of this useless and spent liquor, is very imperfectly and slowly accomplished by subsequent, tedious, and frequent drainings; and, moreover, even after this has been done, that portion which still remains offers great opposition to the entrance of fresh portions of stronger colouring or tanning matter, when the skins or hides are immersed in the tan-pit, and whereby the process is much delayed.

Now, it will be seen that the principal object to be accomplished, in order to effect a more perfect and rapid tanning process, is to cause a certain effectual and speedy dislodgment of the spent liquor, and also to facilitate the entrance of fresh and stronger liquor, that it may be absorbed and taken up by the skins as required, which, by my improvement of the process, is readily done, and by the following means:—

Firstly, I will describe the substances or materials I intend to be used in immediate connexion with the surfaces of the skins or hides. The spunges, or liquor-holders and injectors, must be made of similar dimensions of the hides or skins to be tanned, and may consist of one or more layers of flannel of open texture, or other similar material, which must be capable of holding or retaining a quantity of the tanning liquor, so as to confine it between the threads or fibres, when resting upon or against the surface of the hides or skins, and prevent the liquor being suddenly pressed out laterally, and escaping at the sides or edges, so that the liquid shall be retained until a sufficient time has elapsed for a portion of the liquor to be injected into the pores of the skins, when submitted to pressure in connexion with them. If more than one layer of flannel, or other similar material, is used for this purpose, I should recommend that the threads of one layer should run parallel to, or in the same direction to, those of the other, in order that one thread may be pressed into, or between, those opposite to it, so that the liquid retained between them may be pressed into the hide or skin.

It will be observed, that the under surface of the liquor-holder only is to be in connexion with the hide, and to cause the descent of the liquor to be effectually performed, when submitted to pressure. I sometimes place upon the upper surface of the liquor-holder a layer of India-rubber cloth, or any other fabric (" which I call an injector") which has been made impervious to water, by means of any cement, pitch, or other suitable substance, or sometimes a thin plate of metal, or other material may be used, which must be capable of resisting the upward passage of the liquor, when forced or pressed against the hides or skins under operation. When it is desirable to submit a pile of skins to pressure at the same time, then another skin may be laid upon the upper surface of the injector or liquor-holder, and so on.

Secondly, The drainers or absorbers. The materials which I find more particularly applicable to this purpose is, coarse linen or hempen bagging, or ordinary canvass, and they should be composed of coarse even threads, free from loose or projecting fibres, and a very open texture, several layers of such fabric; say, six or more are to be laid upon each other, and in order to render them more porous, and to prevent the threads of one layer from being pressed down between those of the next, which would be done if the threads composing the fabric were laid parallel, or in similar directions, the threads of one layer of such fabric must be laid diagonally over the one in immediate connexion with it, and so on until a sufficient thickness has been formed, and exactly upon the contrary principle to the construction of the liquor-holders or injectors previously mentioned. In this state the collection of layers of such fabrics forms a substance sufficiently porous for the liquid to run out, upon withdrawing them from an immersion, or for the spent liquor to escape freely, when the hide or skin is pressed upon it, when placed between two skins, and pressed in that position. In order to form a more even surface for the hides or skins to be pressed against, I interpose an outside layer of straw, or a covering of stout blanket-flushing, or other fibrous material, which will protect the surface of the skins when under pressure from the indentations of the coarse threads of the canvass or other fabric. The hides or skins not being of uniform substance, but thicker on those parts which have covered the back and loins of the beast, would not form a pile of uniform height when adjusted for pressure, unless an extra degree of substance were given to those parts of the drainers corresponding to the thin parts of the former; but which I compensate by an extra layer or layers of the canvass or bagging, partially extended to effect the same, or it may be done by the straw or other outside covering, and by this means I increase the facility of regular and uniform pressure. In some cases it may be found convenient to use layers of straw, with the stalks arranged in a similar manner as the threads of the canvass or bagging, and this will be found to possess much the same porous effect. Should, however, the experienced tanner prefer to immerse his hides into the pit by themselves, and in the usual way, or to handle them separately, the absorbers are to be used in a dry or in a slightly damped state, and the drainers in this case may be dispensed with; then these absorbers must consist of a layer or layers of blanketing, or stout woollen cloth, or flushing, or any such suitable material, and having affinity for moisture upon or against which the saturated hides or skins are to be pressed, for the purpose of absorbing the spent liquor. When these absorbers have become saturated with the spent liquor, they must be removed, and fresh ones supplied after the re-immersion of the hides. Thus it will be seen that these drainers and absorbers differ in their nature and application. The former only are to be used when the arrangements of the tanner permit both the immersing and the subsequent pressing of a considerable number of hides or skins adjusted one upon another, together with the drainers, liquor-holders, and injectors in a vat, pit, or other vessel charged with tanning liquor; or the pile may be constructed upon a platform, and altogether let down into a pit, and immersed in the tanning liquor, from whence they are to be withdrawn and conveyed to the press without disturbing the original arrangement of the pile.

I will now proceed to describe the manner of arranging the hides or skins in a vat or other vessel, or upon a platform, for the purpose of immersion, and saturating the skins with a charge or supply of the tanning and colouring matter. Upon the bottom of the vat or platform I extend a drainer (as described above), and upon it I place a hide or skin, with a liquor-holder upon its upper face, and upon this an injector is placed, its under water-proof surface acting upon the liquor-holder, and thus injecting the liquor into the hide or skin, and its upper water-proof surface acting upwards upon the lower surface of another liquor-holder, which has been placed upon it; thus injecting the liquor into the hide above, and so on, until a sufficient pile is constructed, which will be found to consist of about twenty or thirty skins. Upon pressure being applied, as subsequently described, the injectors will force the tanning liquor out of the liquor-holders, and into the pores of the hides or skins, and from which a portion of the spent liquor will at the same time escape into the drainers above and below. After this pile has been properly constructed in the vat, it is to be filled with tanning liquor, and the whole immersed into the hides or skins, and liquor-holders are saturated with liquor, which is afterwards to be withdrawn by a suitable contrivance in the bottom of the vat, when it will be found that a portion of the liquor which had been imbibed in the porous drainers will also pass off, and the liquor absorbed by the liquor-holders will remain. Uniform, mechanical, or other pressure (say about twenty pounds upon the square inch), being now quickly applied upon the upper surface of the pile, in the space of a few minutes the strong liquor will be injected freely into the hides or skins, while that spent liquor which was before in them, after having lost all its tanning effect, will, at the same time, be squeezed or pressed out of the body of the skins, and into the drainers or absorbers. After a short period has been allowed for the spent liquor to run from the drainers, it should be separately withdrawn from the vat, and the latter again filled with fresh and stronger liquor, when the pressure is to be removed, and the different layers will rise in the liquid, separate, and again become saturated with fresh liquor, and the pressure may now be re-applied as before;

which operations may be done several times a day, and continued without intermission until the tanning process is considered complete.

"Having now described the principal features of my invention, which I presume is fully understood, I have only to observe, that instead of laying the hides or skins, liquor-holders, injectors, and drainers, in a pile, and thus submitting them to pressure collectively, or in the mass, I sometimes prefer to submit each skin separately to a similar operation, and which may be found to effect the same in a more perfect and desirable manner, and a contrivance for this object is shown in Plate IX., in which fig. 17, represents a side elevation of the machine; fig. 18, is a plan or horizontal view of the same; and in both these figures, similar letters of reference point out corresponding parts of the machine: *a, a, a, a,* is a framing of cast iron, or other suitable material, having two rails at the top, parallel to each other; with these rails are cast small pedestals, as bearings for the axes, of several pairs of small flanged friction rollers *b, b, b, b,* there is a table, or bed of wood *c, c, c,* this table is to be perforated with very small holes, in order to allow any liquor to pass freely through the table or bed; upon the under side of this table are two small rails, which run in corresponding grooves in the pulleys *b, b, b,* this table being of sufficient dimensions to sustain the skin or hide, when fully extended upon its surface: immediately above the table, in the centre of the machine, is a roller *d, d,* of wood, metal, or other material, which is adjustable in the mortice formed in the upright framing of the machine, and is kept down upon the table, or the pressure regulated by the screws *e, e,* being raised or lowered as required, or by weighted levers, springs, or any other means; upon the shaft of this roller is a spur or toothed wheel *f, f,* having a corresponding pinion *g, g,* geared with it, capable of receiving rotary motion, by power being applied to the winch, or handle *h*; and this gearing may be applied either upon one or both sides of the machine, as may be required.

"Upon the table, or bed *c, c,* I first place a drainer, as above described, and then the hide or skin, after it has been immersed in the pit or vat of tanning liquid, the spent liquor of which is ejected, and a fresh charge of strong liquor supplied in the following manner:—In order to give greater surface, and some degree of elasticity to the roller *d, d,* that it may adapt itself to the inequalities of the skin under operation, I coil twenty to thirty more yards of woollen or worsted and linen lapping, such as that used by printers in a similar object, and at the last few outer coils, of which I enclose an India-rubber cloth, or other water-proof material, in order to form a cylindrical injector; or this injector may, if preferred, be made in the surface form previously described, and laid upon the skins as before. Around this roller *d, d,* may also be lapped or wound a liquor-holder of the material before described; or this liquor-holder may be used in the extended state as heretofore; and it is evident that in that case two or three layers or thicknesses of each material in the rotation heretofore explained, may be passed under the roller at the same time; or if the cylindrical injector or liquor-holder are used, the skins may be operated upon separately, as will be very speedily determined by the experienced operator, and any degree of weight or pressure may be employed as experience will determine, from five to twenty pounds, or more, upon the square inch. After the hide or skin has been made to pass once or twice beneath the roller, the liquor-holder should be charged with fresh liquid, and these operations repeated, until the skin or hide becomes compressed, when it may be again immersed in liquor, and become saturated thereby. Having now sufficiently explained the nature of my invention, and the manner in which the same is to be performed, I wish it to be understood, that I do not claim any of the dimensions or materials of which any of my improved drainers, absorbers, injectors, and liquor-holders, as above explained, or any of the parts or pieces of the machine described, are composed, as it will be very evident that many forms and modifications may be constructed and applied to the same purpose with similar success and effect; and as many well-known mechanical arrangements to suit the same purpose may be employed, I have merely shown the above by way of illustration. But I do claim, firstly, the tanning of any convenient number of hides or skins, or parts thereof, by the aid of mechanical or other pressure, in conjunction with the joint or separate use of my drainers or absorbers, and of the liquor-holders and injectors, in whatever form, or of whatever material, they may be constructed; and, secondly, the application of the same to a roller or rollers, or other suitable form as a rotary bed, capable of receiving the same, and the whole combination, or any part of the materials above described, for the purpose of injecting the tanning liquid into hides or skins, and expelling the spent liquor therefrom."—[*Inrolled in the Rolls Chapel Office, April*, 1837.]

Specification drawn by Messrs. Newton and Berry.

To John Lionel Hood, *of the town and county of the town of Newcastle-upon-Tyne, gentleman, and* Andrew Smith, *of Princes-street, Leicester-square, in the county of Middlesex, engineer, for their invention of an improved mode of manufacturing belts, bands, and straps, to be employed in place of ropes, or chains, and for other useful purposes.*—[Sealed 26th March, 1836.]

This invention of an improved mode of manufacturing belts, bands, and straps, to be employed in place of ropes or chains, and for other useful purposes, has for its object the construction of belts, bands, and straps of a stronger and more durable material, and at the same time they are lighter and of smaller size or dimension, than belts, bands, or straps of an equal strength, composed of the ordinary materials, as hempen yarn, leather, or other matters; and consists in forming the said belts, bands, or straps of strands of metal wire, properly combined and secured together either by weaving hempen or other yarn therewith, or by binding, paying, or serving them with string or spun yarn of hemp, flax, or other fibrous material, or by sewing them together as is usually done in making flat hempen ropes, or by coating them with strong canvass or other woven fabric, and sewing it on to and between the strands, so as to combine them together, and form one flat band, strap, or belt; and which improved belts, bands, or straps, so manufactured, are more particularly applicable to the various purposes for which round or flat ropes, or chains, or leather straps, have been heretofore used; for instance, bands or ropes for mining purposes; large bands, belts, or straps for driving machinery or mill-work; ropes or chains for raising or moving heavy bodies, or for harness for horses, as the traces, reins, and stirrup-straps, which are more particularly applicable for military purposes, from their not being liable to be cut asunder in battle; and further, these improved straps, belts, or bands, may be used in place of chains or rods for suspension piers, bridges, or viaducts, straps for carriage springs, and various other purposes for which chains, ropes, straps, bands, or belts, hitherto composed of solid pieces of iron, hempen or flaxen yarn, or leather, are commonly used for various purposes.

And, in order that the improvements may be better understood, we shall proceed to describe the mode of making or constructing these improved belts, bands, or straps, and refer to the diagrams or figures, or drawings hereto annexed, in order to illustrate the same, although we do not mean or intend to confine ourselves to the precise mode or method described, or to any particular number or quantity of wires or any other details herein mentioned, as the same must be varied to suit different sizes of belts, bands, or straps for various purposes; that is to say, we first prepare any given number of lengths or pieces of metal wire (iron or copper we prefer), of the required length for the intended belt, band, or strap, which pieces or lengths may be straightened and laid alongside of each other, or wound round reels or bobbins. We then take any given number of lengths of wire, according to the size thereof, and also according to the intended strength and dimensions of the belt, strap, or band; and, after laying the proper number of wires, to form each strand, alongside of each other, we cover the lengths of wire with a solution of dissolved Indiarubber or caoutchouc, and oil, asphaltum, pitch, tar, or any anti-corrosive mixture, compound, or solution, which will prevent the lengths of wire from rusting. We then slightly twist the number of lengths of wire together into a strand, as shown in the diagram fig. 19, Plate IX., which represents a portion of a strand in this state, so as just to hold them together; the superfluous anti-corrosive compound being squeezed out of the strand by the twisting thereof. We then take any number of these strands of metallic wire, according to the width of the band, belt, or strap intended to be made, and connect them together by binding, interweaving, "paying," or coating them with string, spun yarn, or twisted strands of any proper fibrous material, also saturated with solution of dissolved India rubber and oil, asphaltum, pitch, tar, or other waterproof and preserving composition, and thereby combine them together, so as to form a strap, band, or belt, as shown in fig. 20, which is a representation of a portion of one of the improved bands, belts, or straps in this state: *a*, *a*, are the strands of wire; *b*, *b*, the hempen or spun yarn interwoven therewith.

The spun yarn, string, or strands of hemp, flax, or other fibrous material may be interwoven with the strands of wire, by placing the strands of wire as warp, in a power loom, and throwing or shooting the spun yarn of hemp or other fibrous material between them as weft, by means of a shuttle, as in the ordinary process of weaving fabrics, the weft being beat up by the stroke of a heavy reed; or the strands of metallic wire may be connected together by sewing them one to the other, as is usually done in making flat hempen ropes, or by coating them with string, canvass, or other woven fabric, and sewing it on to and between the strands, so as to combine them together and form one flat band, strap, or belt. When it is required to connect the ends of these improved belts, straps, or bands together, it may be done much in the usual manner of connecting the ends of leather belts, bands, or straps, or flat ropes, viz. by sewing, rivetting, or screwing them together, one end being laid over the other, and the screws or rivets *c*, *c*, passed through them, and also through two or more pieces of metal *d*, *d*, as shown in fig. 21, which figure is shown only as an example; and when the ends of these metallic belts, bands, or straps are to be connected to eyes or hooks, as in the straps of ship's blocks, pit, or shaft, chains for mining purposes, or other such application, it may be done as shown in figs. 22, 23, 24, 25, and by passing the ends of the strands of wire *a*, *a*, into countersunk conical holes *e*, *e*, made in the butt *f*, of the hook or eye *g*, and upsetting, riveting, or beating out the ends of the wire strands into the conical holes, and securing them by screw caps, or by brasing or soldering the ends of the wire strands into the conical holes; the solder running among the wires and around them, and forming a solid mass, which cannot be drawn out of the conical countersunk holes.

The Patentees here remark, that although they have described the strands of wire as being slightly twisted or spun, so as to hold them together, yet they may be kept quite straight, which will answer the purpose, but we prefer them to be slightly twisted.

In conclusion, the Patentees say that, "Having now described our improvements, and manner of carrying the same into effect, we wish it to be understood, that what we claim as our invention, secured to us by the above in part recited Letters Patent, is the improved mode of making or manufacturing the bands, straps, or belts, by forming them of a number of lengths of metal wire, composing strands, which are connected together so as to form belts, straps, or bands, by means of spun yarn interwoven, bound round, or combined therewith;

or by sewing them together, or covering them with strong canvass, or other woven fabric as above mentioned, thereby forming perfect belts, bands, or straps applicable for various useful purposes; and more particularly for all purposes where flat ropes, or chains, or straps are now used.—[*Inrolled in the Rolls Chapel Office, September*, 1836.]

Specification drawn by Messrs. Newton and Berry.

To William Bates, *of Leicester, fuller and dresser, for his invention of certain improvements in the manufacture of reels for reeling cotton.*—[Sealed 16th September, 1836.]

This invention relates to that class of wooden reels, which are employed for reeling sewing cotton, for the same to be sold thereon, which class of reels have now become a very extensive and important manufacture: such wooden reels have, heretofore, been made by simply cutting wood into the required form, and in order to ornament or to affix devices on the upper end of such reels, it has been common to paste over an ornamental circular surface of paper, but by such application the ornamental end being unprotected is liable to be rubbed and defaced or accidentally removed; and there have been wooden reels ornamented by applying a covering to the upper surface of embossed plates of thin metal, which being of a larger diameter than the end of the reel, the edges of such metal were turned down over the ends, and thus became securely held on the end of the reel. Now, the object of this invention is, to sink a portion of the upper surface of the reel in such manner, that the ornamental material may be securely placed within the recess formed by such sinking of a part of the surface, there being a raised edge formed all round such recess, which serves to protect the ornamental surface placed in the recess, and the external ring being by preference slightly inclined, tends to prevent such ornamental surface becoming defaced or injured, and from being accidentally removed. A sunk part or recess is formed at one end of the reel, and a ring or raised edge bounds the recess, and may form part of, or be affixed to the end of the reel; and this ring being inclined at its inner edge, the ornamenting material will not fall out, or be injured or defaced, being retained and protected by the said ring. In order to place the ornamental surface within the recess at the end of the reel, a disc of paper or of thin metal, or other suitable material, embossed or otherwise ornamented, or marked with a device (according to the taste of the maker, or those for whom the reels are being made), is to be cut or formed of dimensions equal to the sunk part or recess, and consequently of a larger diameter than the upper part of the inner circumference of the ring, such disc of ornamental material is to be slightly dished, rendering the upper surface thereof a little convex, so that the disc will readily pass into the recess, and when within the boundary ring, the disc is to be pressed flat, by which means the surface of the recess will be covered, and it will be retained therein.

One description of ornaments capable of great variety, is a disc or plate of coloured paper or other suitable material, and another, a disc of thin metal or foil, embossed with any device: these parts may be greatly varied in colour and device, and which from their being laid within a recess, and when necessary fixed therein by paste or other suitable material, will not be liable to injury, or of being accidentally removed; and thus may a great variety of ornamental ends be used, whether embossed, engraved, printed, or coloured, and being once placed in the recess at the end of the reel, will not be liable to injury or accidental removal. —[*Inrolled in the Inrolment Office.*]

SCIENTIFIC ADJUDICATIONS.

IN THE COURT OF KING'S BENCH.

MINTER *v.* MOWER.

"This was an action commenced by the plaintiff, the patentee o 'the self-adjusting reclining chair,' against the defendant for an alleged infringement of plaintiff's patent. The chair which was the alleged infringement is known in the trade as 'the wedge-chair.' The defendant pleaded that he was not guilty of infringement, that the specification did not truly ascribe the plaintiff's invention, and that the plaintiff was not the first inventor. (A previous action had been tried in the Court of Exchequer, between the plaintiff and Messrs. Wells and Hart, for selling the wedge-chair, and the plaintiff obtained a verdict against them, as they were unable to show the existence of any chair on the same principle, previous to the patent.)

" On 13th July, 1835, this cause was tried before Lord Chief Justice Denman and a special jury, at Guildhall, and the defendant proved the manufacture of chairs at his own manufactory, containing a leverage on the same principle as that described in plaintiff's specification, at a time previous to the date of the patent, but such chairs contained, in addition, a sliding pad to the arm, and a spring which relieved a stop acting on a rack at the end of the lever. The jury found 'that the plaintiff had invented nothing, that John David Browne (who had been in defendant's employ) was the inventor of the self-adjusting leverage, but tha he was unaware of the manner in which it could be applied; the pad and spring being incumbrances, and that plaintiff, they thought, had discovered that." Upon this finding Lord Denman directed a verdict for the plaintiff with liberty to the defendant to enter a nonsuit.

In Michaelmas term following, defendant obtained a rule *nisi*, which came on for argument in Hilary term last, when the Attorney-General, Sir F. Pollock, and Mr. Evans; were heard on behalf of the plaintiff; and Sergeant Talfourd and Mr. Godson for the defendant, and the Court desiring time to consider the case, the following judgment was given by Lord Denman, as the resolution of the Court on the 5th May last:—

N.B.—It was not against the same defendant, but against Wells and Hart.—"An action *between the same parties* has already deen decided by the Court of Exchequer, in which the patent claimed by the plaintiff was deemed good and valid. But on the trial in this court an entirely new fact was given in evidence, and affirmed by the verdict of the jury, namely, that a chair very closely resembling that made by the plaintiff's patent had been made and sold, before that patent was taken out. The words of the jury were these, 'we are of opinion that Browne was the inventor of the machine, and found out the principle, but not the practical purpose, to which it is now applied: we think that Minter the plaintiff made that discovery.'

"This statement might not be fatal to the plaintiff's title of his invention, which was truly set forth in the plaintiff's specification; but the issue in this case being simply whether the plaintiff did thereby particularly describe and ascertain the nature of the said invention, we find it needful to examine the terms of it.

"Now the patent is taken out for 'an improvement in the construction, making or manufacturing of chairs.' The method of making the machine and the way in which it acts are then fully described, without any mention of the means employed in Browne's chair. The specification thus concludes: 'what I claim as my invention is the application of a self-adjusting leverage to the back and seat of a chair, whereby the weight on the seat acts as a counterbalance to the pressure against the back of such chair, as above described.'

"Now it was perfectly clear upon the evidence, that this description applied to Browne's chair, though that was encumbered with some additional machinery. The specification, therefore, claimed more than the plaintiff had invented, and would have actually precluded Mr. Browne from continuing to make the same chair, that he had made before the Patentee's discovery. We are far from thinking that the Patentee might not have established his title by showing that a part of Browne's chair could have effected that for which the whole was designed, but his claim is not for an *improvement upon Browne's leverage*, but for a leverage so described, that the description comprehended Browne's. We are, therefore, of opinion that the patent cannot be sustained, and a nonsuit must be entered.

"YOUNG AND SON,
"DEFENDANT'S ATTORNEYS,
"*Parliament-street, Westminster.*"

In the case of Wetterstedt and Key *v.* Lockerby coram, Lord Denman, Chief Justice King's Bench, sittings in London, 14th May, 1837, the plaintiffs brought assumpsit for goods sold, &c., plea the general issue only. It appeared at the trial, that in November 1832, a quantity of the marine sheathing was sold by the plaintiffs, the present possessors of the patent, to the defendant (a considerable ship-owner), for sheathing the *Lalla Rookh* at 4½d. per pound.

The vessel, when sheathed, sailed on a voyage for the Brazils. The captain swore, that during the first twenty-one days she sailed well, after that she sailed badly. On her arrival, the ship was examined, and her bottom was found to be covered with barnacles; she was cleaned or careened at the Brazils; she was afterwards 110 days on her voyage to Liverpool, the usual time was forty to forty-five days; she grew worse the longer she was out.

When her cargo was delivered, her bottom was one bed of oysters and muscles. The marine sheathing was then stripped off, and she was coppered on paper, and the old metal returned at 1½d. per pound. The action was brought for the difference: some vessels sheathed with the marine sheathing have returned with the metal not fouled. This sheathing would protect from worms.

After hearing Thessiger for the defendant, Lord Denman, Chief-Justice, said it was an experimental matter, and both parties had some opportunity of exercising their judgment.

Verdict for the plaintiffs for the difference, 86*l.* 1s. 9d.

SCIENTIFIC NOTICES.

Report upon the Commerce between England and France. **By** Horace Say. Extracted from the Documents, published by Messrs. Villiers and Bowring.—Librarie du Commerce à Paris.

Mr. Horace Say, the son of the celebrated economist of that name, after having slightly touched upon the external commerce of France from the beginning of the seventeenth century, proceeds to show the advantages which would be the natural result of a still more liberal system in our customs. We find in this learned little treatise that France has invariably sent to the English to the amount of from 18 to 20 millions of francs, since the repeal of the prohibition. In 1832, France exported to England 160,000 pair of gloves, of a value of more than two millions of francs, 50,000*l.*, whilst the duty payable is about 30 per cent. The English customs have received for that article alone more than 685,000 francs, 27,400*l.* The commerce of France with England in 1830, according to Mr. Say, realised a revenue to the English customs of 5,780,000 francs, 2,312,000*l.*, and it is to be remarked that when an equitable duty is put in force in place of entire prohibition, and when it is low enough to prevent contraband trade, the gross amount will then become a considerable augmentation of the net product; for the expenses of the custom, which is necessary for the collection, are not so much as those which would be necessary to prevent smuggling. Mr. Say, after a profound examination, and the citation of facts in support of his arguments, concludes with the wish to see given to international relations all the development of which they may be susceptible. "With an active commerce between all nations," says he, "war, always disastrous as well to the conqueror as the conquered, would by the will of all become a total impossibility." We can but admire and applaud the sentiments which animate the author, and wish with him for a lasting peace and universal commerce with all nations.—*Recueil Industriel.*

A MODE OF DESTROYING CATERPILLARS AND OTHER INSECTS WHICH ATTACK FRUIT TREES.

A landholder, in the county of York, gives an account in the following terms, of the means which he has found to succeed best in getting rid of caterpillars:—

"Having tried without success a great many schemes for destroying caterpillars, which every year do a great deal of mischief in my garden, the idea struck me that oil would deliver me from the ravages committed by these insects. In consequence of this, at the time when the caterpillars begin to show themselves, I smeared the stem or stalk, and some of the larger branches of two or three of the plants, from the soil to the leaves, with some fish oil, which was administered with a soft brush. When I visited the bushes a few days afterwards, I saw that those which had been treated in this manner were perfectly untouched, whilst those which had not been oiled were devoured by the caterpillars. I then treated these latter as I had treated the others, and soon found them entirely free from insects, and they produced fruit in abundance. I have since employed this means once every year, and I have found that my gooseberry bushes are more healthy and vigorous, and at the same time always productive. I have since tried this receipt upon a small cherry tree, which the insects had attacked and nearly caused to perish the preceding year; it has equally succeeded upon this last, and the tree has yielded, ever since, excellent crops of fruit. Some friends to whom I have advised to adopt the same means, have had the same success as myself; I have reason to believe that the oil not only destroys the larvæ of the insects, but that it prevents the perfect insects from depositing their eggs in the cracks in the trunk of the tree.—*Recueil Industriel.*

List of Patents

Granted by the French Government from the 1st of January, 1836.

(Concluded from p. 113.)

— Milan and Franchot, of Paris, for improvements in lamps.

— Jean Pierre Commarmot, of Paris, for an improved syringe.

— Louis Fourneur, Angouleme, for an uranographic instrument.

— Jean Belon, of Havre, for a new system of pump, applicable to mechanical lamps.

— Louis Millot, of Marseille, for an improved iron bed.

— Pierre Bernardet, of Marseille, for a new method of extracting oils from the olive and from coal.

— Jean Baptiste Vuillaume, instrument maker, of Paris, for improvements in the construction of bow used for volins

— Christophe Sermet, of Paris, for the composition of an Indian liqueur.

— Alexandre Cottian, of Paris, for a new charger applicable to powder-horns.

— Laurens and Dufournel, of Paris, for a means of utilising the heat lost in smelting furnaces.

— Frederic John, of Paris, for a new instrument, called by him *Trombonne à pistons.*

— Emmanuel Charbonnieres, of Condom, for an improved lamp.

— Alexandre Apuril, for a machine for thrashing and winnowing corn.

To Rollet and Aubonin, of Rochefort, for a machine for making bread and biscuit.

— Etienne Nicot, of Paris, for a new system of lamp for lighting billiard rooms.

— Antoine Aguiga, of Perilueux, for a method of preventing chimneys from smoking.

— Nicolas Bidan, of Besancon, for improvements in the construction of the drawer of any piece of furniture.

— Legent and Treille, of Estrée, St. Denis, for a machine for manufacturing bricks.

— Julien Joseph Jacquin, clock-maker, of Troyes, for a machine for drawing in narrowing stockings on the frame.

— Aygaleng Raulin, of Arras, for a new evaporating apparatus, applicable to the concentration of saccharine juices.

— Bonis and Thevenot, for improvements in lithography.

— John Sheppard, of London, for an improved lamp.

— Sylvain Bondard, of Paris, for a machine for measuring the hand, called by him Chirometer.

— Pierre Albert Bonnair, of Vaucelle, for a machine for grinding and polishing plate glass.

— Pierre Gacon, of Bordeaux, for a machine for doubling threads, applicable to every system of spinning.

— Auguste Joseph Lesire, of Paris, for an improved bit for horses.

— Charles Marie Valliere, of Paris, for a new method or kind of shoe.

— Francois Fongy, of Besancon, for a new method of manufacturing the escapement in the watches on the *Lepine* system.

— Philbert and Co., of Nantes, for a new method of manufacturing felt for the doubling of ships.

— Jean Baptiste Courty, of Paris, for an improved elastic stock for gentlemen.

— Gautier, Brothers, and Co., of Besancon, for an improved printing press.

— The Count of Rochefort, of Paris, for an improved method of preparing all kinds of skins.

— Pierre René Gallot, of Paris, for a pectoral paste, called by him *Looch solide*.

To Prosper Henri Moim, of Paris, for a method of instruction, called by him *Polytechnographie.*

— Jean Baptiste Pierrard, of Remes, for a new hydraulic machine, to be used instead of steam-engines.

— Jacques Bourdeaux, of Montpellier, for improvements in certain surgical instruments.

— Heitschlin and Gilardoni, of Altkirk, for a new method of seting tile floorings with inlaid ornaments.

— Charles Armand Lory, of Paris, for a mechanical lamp.

— Francois Wattebled, of Paris, for a liquid called *Anti-cox*, calculated to remove corns without any pain.

— Salomon Van Oven, of London, for an improved pump.

— Frederic Kresse, of Paris, for an improved method of preparing Hongary leather.

— Jean Benoit Mallat, of Paris, for a tool for turning on the lathe the most delicate pieces in clock-work.

— Veyron Lacroix, of Lavour, for a new system for manufacturing either indigenous or exotic sugar.

— Sailly Herbelot, and Genot Dufay, of Calais, for a new method of manufacturing spotted bobbin net.

— Jean Gabriel Chevalier, of Paris, for improvements in spectacles.

— Loffet and Manger, of Canteleu, for a machine for printing, with several colours at once, silk, woollen, or cotton fabrics.

— Louis Auger, of Yon, for a new apparatus for sawing deal.

— Maximilien Joseph Didier, of Paris, for mineral teeth, set on a moveable plate.

— Guichard Senior, of Paris, for improvements in the instrument called *Ophieleide.*

— Nicaise Petit Jean, of Avise, for a new basket for packing of Champagne wine.

— Parizot Bourdon, of Chalons-sur-Saône, for an improved pump.

— Roizard Lutel, for improvements in the stocking frame.

— Pierre Chire, of Rouen, for a gim with a moveable breech.

— Francois Réné, of Lacour, of Paris, for improvements in the manufacture of coffee.

— Charles Dollfus, of Mulhausen, for improvements in calico printing by means of a roller.

List of Patents

Granted in Scotland between 22nd April and 22nd May, 1837.

To George Crane, of Ynescedywyn Iron-works, near Swansea, iron-master, for an improvement in the manufacture of iron.—26th April.

— Nathaniel Partridge, of Elm Cottage, near Stroud, for a certain improvement or certain improvements in making and preparing oil-paints, whereby a saving of ingredients, commonly used, will be effected.—27th April.

— James Hardy, of Wednesbury, Staffordshire, for certain improvements in the manufacture of iron into cylindrical, conical, and other forms, suited for axletrees, shafts, and other purposes. —27th April.

— Christopher Nickels, of Guildford street, Lambeth, in consequence of a communication from a foreigner residing abroad, for improvements in preparing and manufacturing caoutchouc, applicable to various purposes.—29th April.

— William Coles, of Charing Cross, for certain improvements applicable to locomotive carriages.—29th April.

— Moses Poole, of Lincoln's-inn, in consequence of a communication from a foreigner residing abroad, for improvements in making fermented liquors.—10th May.

— Joseph Bunnett, of Newington Causeway, Southwark, window-blind maker, for certain improvements in window shutters, which improvements may also be applied to other useful purposes.—12th May.

— Samuel Dawes, of Birmingham, iron-master, for improvements in smelting the ore or oxides of iron, copper, tin, lead, zinc, and other metals, and in re-melting or refining the said metals.—15th May.

— Joseph Amesbury, of Burton-crescent, London, for certain apparatus for the relief or correction of stiffness, weakness, or distortion in the human spine, chest, or limbs.—20th May.

— John Gordon Campbell, of Glasgow, merchant, and John

Gibson, of the same place, throwster, for a new or improved process or manufacture of silk, and silk in combination with certain other fibrous substances.—20th May.

To Henry William Craufurd, of John-street, Berkeley-square, London, for an improvement in the coating or covering iron and copper, for the prevention of oxydation.—22nd May.

New Patents

SEALED IN ENGLAND,

May, 1837.

To Alexander Dixon and James Dixon, of Cleckheaton, near Leeds, in the county of York, manufacturing chemists, for their invention of improvements in dyeing, by the application of materials not hitherto so used.—Sealed 29th April—6 months for inrolment.

To Joseph Barker, of Regent's-street, Lambeth, in the county of Surrey, artist, for his invention of certain improvements in the construction or making of umbrellas and parasols.—Sealed 29th April—6 months for inrolment.

To Jean Baptiste Mollerat, of No. 27, Leicester-square, in the county of Middlesex, manufacturing chemist, for his invention of an improvement or improvements in the manufacture of gas for illumination. —Sealed 2nd May—6 months for inrolment.

To John Heathcoat, of Tiverton, in the county of Devon, lace manufacturer, for his invention of a new or improved method or methods of manufacturing, producing, forming, or fashioning ornaments, or ornamented work, or figures, upon, or applicable to, gauze, muslin, and net, and divers kinds of cloth, stuff, or woven textures; and also certain machinery, tools, implements, or apparatus to be used in manufacturing, producing, forming, fashioning, and applying such ornaments or ornamented work.—Sealed 4th May—6 months for inrolment.

To Thomas Wells Ingram, of Birmingham, in the county of Warwick, horn button manufacturer, for certain improvements in the manufacture of certain descriptions of buttons, and in the tools used to manufacture the same, being a communication from a foreigner residing abroad.—Sealed 4th May—6 months for inrolment.

To Thomas Baylis, of Tamworth, in the county of Stafford, civil engineer, for certain improvements in heating and evaporating fluids, being a communication from a foreigner residing abroad.—Sealed 6th May—6 months for inrolment.

To Henry Ross, of Leicester, worsted manufacturer, for his invention of improvements applicable to the combing of wool and goat hair.—Sealed 11th May—6 months for inrolment.

To George Hayman, of St. Sidwell-street, Exeter, coach builder, for his invention of certain improvements in two-wheeled carriages—Sealed 6th May—6 months for inrolment.

To Angus Robertson, of Peterborough-court, Fleet-street, in the city of London, gentleman, for certain new or improved machinery for, or methods of, sculpturing, cutting, shaping, moulding, and otherwise figuring and working marble, stone, alabaster, and other substances suitable for sculpture, and for taking copies of the works produced thereby, or of similar works produced by the ordinary means; and also an improved process or method of taking casts of the living human face, or figure, or other forms, being a communication from a foreigner residing abroad.—Sealed 6th May—6 months for inrolment.

To Thomas Bell, of South Shields, in the county of Durham, manufacturing chemist, for his invention of certain improvements in the manufacture of sulphate of soda, which improvements, or parts thereof, are applicable to other purposes.—Sealed 8th May—6 months for inrolment.

To William Nairne, of Millhaugh, near Methven, in the county of Perth, flax-spinner, for a certain improvement or certain improvements in the machinery of reels used in reeling yarns, being a communication from a foreigner residing abroad.—Sealed 8th May—6 months for inrolment.

To Peter Steinkeller, of the London Zinc Works, Wenlock-road, in the parish of St. Leonard Shoreditch, and county of Middlesex, gentleman, for certain plates or tiles made of zinc or other proper metal or mixtures of metals, applicable to roofs or other parts of buildings, being a communication from a foreigner residing abroad. —Sealed 8th May—2 months for inrolment.

To John Spurgin, of Guildford-street, Russell-square, in the county of Middlesex, doctor of medicine, for his invention of an improvement or improvements in the mode or means of propelling vessels through water, and part of which means may be applied to other useful purposes.—Sealed 8th May—6 months for inrolment.

To John Hague, of Castle-street, Wellclose-square, in the county of Middlesex, engineer, for his invention of certain improvements on wheels for carriages.—Sealed 10th May—6 months for inrolment.

To James Boydell, jun., of Dee-cottage, near Hawarden, in the county of Flint, Esq., for his invention of certain improvements in propelling carriages.—Sealed 11th May—6 months for inrolment.

To William Bell, of Edinburgh, in the kingdom of Scotland, Esq., for his invention of certain improvements in heating and evaporating fluids.—Sealed 11th May—6 months for inrolment.

To Edward Austin, of Warwick-place, Bedford-row, in the county of Middlesex, for his invention of certain improvements in raising sunken vessels and other bodies.—Sealed 12th May—6 months for inrolment.

To Pierre Barthelemy Guinibers Debac, of Brixton, in the county of Surrey, civil-engineer, for his invention of certain improvements applicable to railroads.—Sealed 13th May—6 months for inrolment.

To William Rhodes, gentleman, and Robert Hemingway, mechanic, both of Earls Heaton, near Dewsbury, in the county of York, for their invention of certain improvements applicable to machinery for carding and piercing wool in process of manufacture in woollen mills.—Sealed 22nd May—6 months for inrolment.

To George Nelson, of Leamington Priors, in the county of Warwick, gentleman, for his invention of a certain new or improved process or processes, by the use of which, the qualities of a certain gelatinous substance, or certain gelatinous substances called isinglass may be improved.—Sealed 22nd May—6 months for inrolment.

To Samuel and William Smith, of Luddenden Foot, near Halifax, in the county of York, worsted spinners, for their invention of certain improvements in machinery for combing or clearing sheep's wool and goat's hair.—Sealed 23rd May—6 months for inrolment.

To Elijah Leak, of Hanley, in the parish of Stoke, and county of Stafford, engineer and lathe maker, for his invention of certain improvements in the construction of shutters and sashes for windows of buildings, which improvements are also applicable to hot-houses or conservatories, carriages, and other purposes, and in the mode of fitting or using the same.—Sealed 23rd May—6 months for inrolment.

To Charles Pierre Devaux, of Fenchurch-street, in the city of London, merchant, for a new or improved apparatus for preventing the explosion of boilers or generators of steam, being a communication from a foreigner residing abroad.—Sealed 23rd May—6 months for inrolment.

To Baron Henry de Bode, Major-general in the Russian service, of the Edgeware-road, in the county of Middlesex, for his invention of improvements in apparatus for retarding and stopping chain or other cables or ropes on board ships or vessels.—Sealed 23rd May—6 months for inrolment.

To Charles Joseph Freeman, of Frederick's-place, Kennington-lane, in the county of Surrey, gentleman, for his invention of an improvement or improvements in the machinery or apparatus called rolls, for rolling iron or other metals, applicable to rails for roads, and bars of various shapes for other purposes.—Sealed 25th May—6 months for inrolment.

METEOROLOGICAL JOURNAL,

FOR APRIL AND MAY, 1837.

1837.	Thermo.		Barometer.		Rain in inches.	1837.	Thermo.		Barometer.		Rain in inches.
	Hig.	Low.	High.	Low.			Hig.	Low.	High.	Low.	
April						May					
26	62	39	29,77	29,75	,175	11	53	25	29,93	29,86	,0125
27	54	31	29,73	29,67		12	57	31	29,83	29,74	
28	56	29	29,65	29,57	,0125	13	59	27	29,77	29,76	,1
29	53	35	29,53	29,31	,025	14	59	28	29,86	29,73	,05
30	60	43	29,51	29,35	,1625	15	54	36	30,07	29,95	,05
May						16	61	37	30,24	30,20	,0125
1	64	41	29,73	29,61	,05	17	70	29	30,23	30,13	
2	64	37	29,86	29,85	,025	18	55	40	30,12	30,10	
3	64	39	29,77	29,65		19	53	32	30,04	30,01	,025
4	61	37	29,86	29,73		20	53	28	29,95	29,86	,025
5	60	34	30,00	29,92		21	49	30	29,73	29,70	,025
6	58	26	30,07	30,04		22	53	27	29,82	29,70	,075
7	59	25	30,02	29,92		23	58	30	29,90	29,86	,0125
8	53	35	29,82	29,66	,025	24	62	23	29,89	29,86	
9	55	30	29,60	29,59	,225	25	63	25	29,80	29,78	
10	47	22	29,72	29,58	,0125						

Edmonton. CHARLES HENRY ADAMS.

Latitude 51° 37 32 N.

Longitude 3 51 West of Greenwich.

CELESTIAL PHENOMENA, FOR JUNE, 1837.

D.	H.	M.	
1			Clock after the ⊙ 2m. 35s.
	—		☽ rises 2h. 37m. M.
	—		☽ passes mer. 10h. 24m. M.
	—		☽ sets 6h. 27m. A.
3	5	33	♀ in conj. with the ☽ diff. of dec. 3. 33. S.
	6	34	☿ in conj. with the ☽ diff. of dec. 5. 55. S.
	7	44	Ecliptic conj. or ● new moon.
	13	23	☿ in conj. with ♀ diff. of dec. 2. 25. S.
5			Occul. c. in Geminorum, im. 9h. 26s. em. 9h. 35m.
	—		Clock after the ⊙ 1m. 56s.
	—		☽ rises 4h. 48m. M.
	—		☽ passes mer. 1h. 51m. M.
	—		☽ sets 10h. 50m. A.
	23		☿ in Aphelion.
6	8	45	☿ in inf. conj. with the ⊙
	—		Occul. ω′ in Cancer, im. 7h. 5 m.
7	17		☽ in apogee.
	18	58	♃ in conj. with the ☽ diff. of dec. 4. 22. S.
9	13	3	♂ in conj. with the ☽ diff. of dec. 3. 23. S.
10			Clock after the ⊙ 1m. 0s.
	—		☽ rises 10h. 30m. M.
	—		☽ passes mer. 5h. 43m. A.
	—		☽ sets 0h. 27. M.
11	10	30	☽ in □ or first quarter.
12	20		♅ stationary.
14			Mer. R. A. 4h. 45m. dec. 18. 5. N.
	—		Ven. R. A. 5h. 56m. dec. 24. 5. N.
	—		Mars R. A. 10h. 37m. dec. 9. 56. N.
	—		Vesta R. A. 23h. 11m. dec. 10. 35. S.
	—		Juno R. A. 13h. 16m. dec. 3. 19. N.
	—		Pallas R. A. 1h. 22m. dec. 2. 32. N.
14			Ceres R. A. 3h. 20m. dec. 12. 44. N.
	—		Jupiter R. A. 9h. 11m. dec. 17. 10. N.
	—		Saturn R. A. 14h. 38m. dec. 12. 50. S.
	—		Georg. R. A. 22h. 42m. dec. 9. 7. S.
	—		☿ passes mer. 23h. 10m.
	—		♀ passes mer. 0h. 32m.
	—		♂ passes mer. 5h. 6m.
	—		♃ passes mer. 3h. 40m.
15			Clock before the ⊙ 0m. 2s.
	—		☽ rises 4h. 50m. A.
	—		☽ passes mer. 9h. 22m. A.
	—		☽ sets 1h. 26m. M.
	23		♄ in conj. with the ☽ diff. of dec. 3. 44. N.
18	30	52	Ecliptic opp. or ○ full moon.
	7	12	☿ stationary.
19	20		☽ in Perigee.
20			Clock before the ⊙ 1m. 5s.
	—		☽ rises 10h. 50s. A.
	—		☽ passes mer. 1h. 29m. M.
	—		☽ sets 4h. 55m. M.
	—		Occul. (170) in Capricorni, im. 11h. 5m., em. 12h. 57m.
21	4	37	⊙ enters Cancer; summer commences.
	—		Occul. (243) in Capricorni, im. 15h. 47m., em. 16h. 57m.
22	21	9	♅ in conj. with the ☽ diff. of dec. 3. 30. N.
25			Clock before the ⊙ 2m. 10s.
	—		☽ rises 0h. 6m. M.
	—		☽ passes the mer. 6h. 4m. M.
	—		☽ sets 0h. 17m. A.
	5	59	☽ in □ or last quarter.
26	9	42	☿ greatest Hel. lat. S.
30	13		☿ in conj. with the ☽ diff. of dec. 6. 56. S.
	16	2	☿ greatest elong. 21. 28. W.

The eclipses of the Satellites of Jupiter are not visible at Greenwich during this month.

J. LEWTHWAITE, Rotherhithe.

THE

London

JOURNAL AND REPERTORY

OF

Arts, Sciences, and Manufactures.

CONJOINED SERIES.

No. LXIV.

Recent Patents.

To JOHN M'DOWALL, *of Johnstone, in the county of Renfrew, North Britain, and of Manchester, in the county of Lancaster, engineer, for his invention of certain improvements in machinery for sawing timber, and in the mode of applying power to the same.*— [Sealed 24th June, 1836.]

THIS invention consists, firstly, in an improved construction or arrangement of machinery for sawing and cutting timber into planks or boards; secondly, in a modification of the same, suited to the sawing or cutting of balks or logs of heavy timber into scantlings or boards; thirdly, in the adaptation of a steam cylinder and piston to each of the said cutting frames, for the purpose of independently driving its machinery.

By this arrangement each sawing frame is converted into a separate engine, is perfectly distinct from the adjoining sawing frames, is capable of being worked or stopped at the pleasure of the operator, without affecting any other of the said frames contiguous to it, and by this may be driven faster or slower than the others, as the qualities or natures of the various kinds of timber under operation may require.

These improved machines may be used (when not employed in cutting) as ordinary steam-engines, for driving other machinery by various modes, as placing a pulley on the main driving shaft of the engine, which, by having a strap passed round it, may either be made to drive circular saws, or for other light works.

In case of this improved arrangement of sawing machinery being constructed without the steam cylinder and piston, it may be actuated by an ordinary stationary steam-engine, there being a fast and loose pulley mounted upon the main shaft, and a strap leading from the actuating part of such station engine may be connected to the said driving pulley.

In order that these improvements may be clearly understood, have I attached to this specification drawings, exhibiting the machinery in complete elevation and sectional views; and I have marked the same with several letters of reference, which respectively point out similar parts in all the figures.

Plate X., figs. 1, 2, and 3, represent the "*saw-frame,*" intended to be employed to saw or cut "deals" or small timber into such boards or planks as may be required. Figs. 4, 5, and 6, exhibit the "*balk frame,*" or that which is proposed to be employed for cutting or sawing heavy balks or logs of timber into planks or thicknesses called "scantlings" or boards.

Fig. 1, represents a front elevation of the improved machine for cutting light timber, called the "deal frame." Fig. 2, is an end elevation, or side view, taken at the left hand of fig. 1; and fig. 3, is a partial sectional elevation taken vertically at the dotted lines A, B, in fig. 1.

The standards or main upright framings of the machine are shown at *a*, *a*, bolted to the foundation, and otherwise firmly secured in their places by flanges, and they are also bolted to the main beams that support the flooring *b*, *b*, thus dividing the machinery between the upper and lower apartments; the one of which contains the engine or driving power, while the other is occupied by the machinery which more immediate operates upon the timber.

The cylinder of the steam-engine, by the agency of which the sawing machinery is to be driven, is shown at *c*: it is supplied with steam in the usual manner through slide valves, contained in the valve box or steam chamber *d*, *d*, being fed or charged with steam from the boiler through the main steam pipe *e*, and the induction pipe *f*; and from which box or chamber the steam is discharged by the eduction pipe *g*, into the waste steam pipe *h*, *h*, after its elastic force has been exerted upon the piston.

The main driving shaft *i*, *i*, is mounted upon pedestals or bearings fixed upon the top of the upright castings or standards *a*, *a*: this shaft carries two fly wheels *j*, *j*; two eccentrics *k* 1, and *k* 2, and also two disc crank plates *v*, *v*, in which are fixed the crank pins *m*, *m*, connected by the links or rods *p*, *p*, to the shaft *n*, *n*, carrying the frame of saws *o*, *o*, which travel in the slides or guide pieces *o**, *o**, attached to the frames *a*, *a*.

It will be seen that while the eccentric *k* 1, is working the slide valves, which admit and discharge the steam to and from the cylinder *c*, the eccentric K 2, is imparting motion to the spur wheels *q*, *q*, for the purpose of feeding or leading forward the timber, by means of the link or rod *r*, *r*, and ratchet or click *s*, *s*, driving the ratchet wheel *t*, and pinion *u*, which is keyed upon the same carrying stud or bearing.

These spur wheels *q*, *q*, which are of rather a fine pitch, give a slight progressive motion to the timber under operation, by means of the system of mitre wheels and shafts *v*, *v*, *v*, *v*; and it will be perceived that those of the four lower pairs of mitre wheels that are in vertical positions, are mounted upon the ends of shafts carrying the indented iron feeding rollers *w*, *w*, which, by the above arrangement of the gearing, all receive an equal progressive motion simultaneously, and thus feed in the timber shown at *x*, *x*.

By these means, the timber in its progress through the machine or sawing frame is gradually advanced and presented to the teeth of the saws, as they are driven up and down by the reciprocating action of the piston rod *y*.

It will also be understood that the extent of progressive motion given to the feeding rollers, through the agency of the system of gearing above explained, may be varied and adjusted by the click or ratchet *s*, being caused in its receding movements to escape over a greater or less number of teeth of the ratchet wheel *m*, and thus produce a quicker or slower advance of the timber according to the nature of its grain, or the number of saws which are acting upon it.

The governor, by which the supply of steam to the steam chamber or valve box is regulated, is placed at the top of the machine, and is of the ordinary construction; the working parts of the governor being attached to the circular plate or disc of metal *z*, which is driven by the friction of the periphery of the revolving collar 1, keyed upon the main shaft. This mode of driving the governor simply by friction is preferred, because it admits of ready adjustment, by sliding the collar nearer toward or further from the centre of the plate *z*, thereby regulating the speed of the governor, as may be desired by the operator or engineer, whenever it is necessary to vary the speed of the engine to suit the different qualities of the timber to be operated upon.

Having now described the general construction of the improved sawing frame, the Patentee says, "I proceed to show the mode of putting the same into operation. Let it be understood that I prefer the engine for communicating the power to be upon the high-pressure principle, and that the engine shown in the drawing, figs. 1, 2, and 3, is supposed to be upon that construction representing one of about seven horse power, and which will be generally found sufficient to operate upon deals and such like ordinary timber. This engine is shown in that position called the 'half stroke.'"

The engine being first started or put in motion in the ordinary way by opening the throttle valve, which is placed in the induction pipe *f*, and thus admitting the steam or other elastic vapour, its expansive force will cause the piston *y*, to rise, and by the cross head 2, 2, and side links 3, 3, will draw up the shaft *n*, *n*, carrying the frame of saws *o*, *o*; and thus through the connecting rods *p*, *p*, will drive the crank plates *l*, *l*, round, and thereby communicate rotary motion to the main shaft *i*, *i*, which will impart its impetus to the fly wheels *j*, *j*, and at the same time cause the eccentrics K 1, K 2, to revolve; the eccentric K 1, giving a reciprocating motion to the slide valves through the rod 4, the links 5, 5, and shaft 6; and thus as the piston works up and down in the cylinder in the ordinary manner, it will clearly be perceived that the necessary reciprocating action will be given to the frames containing the system of saws *o, o, o*: these saws are of course adjustable in their respective frames, so that any number may be employed, and also set at any required distance apart.

It has been before stated, that as the engine is in operation, the other eccentric K 2, will also cause the timber to advance to the teeth of the saws, as required by the system of gearing, which works the four indented feeding rollers *w, w, w, w*. It will also be perceived by reference to fig. 1, that each of the vertical shafts *v, v*, have a feather or raised key 7, upon their surface, in order to carry the horizontal mitre wheels round with them, and at the same time to allow these mitre wheels to be raised and lowered (whilst running) upon the shaft, in case of any inequalities upon the surface of the timber under operation causing the upper feeding rollers *w, w*, to rise or fall as the boss of the pair of horizontal wheels is elongated, and has a groove turned upon it in order to embrace the end of the shaft of the feeding rollers, as shown at 8. Ordinary feeding tables with delivering rollers are placed in front of the machines or sawing frames, in order to conduct the "deals" or timber to be cut on to the plates 9, 9, upon which they are supported while under the operation of cutting; and upon this plate, at the feeding end or front of the machine, there is placed a central guide piece or "fence" 10, against which the "deals" are to be pressed by the springs 11, 11, having friction rollers at their ends for this purpose. These springs are adjusted, or the tightness of the pinch regulated by the small winch and screw 12; and similar tables are placed behind the machines to receive the timber after it has been cut into boards.

It will be seen that there are two weights 13, 13, suspended from the shafts of the upper pair of feeding rollers *w*, *w*, by the rods 14, 14, in order to keep them down upon the top edge of the timber with sufficient pressure to resist the upward lift of the saws when cutting. These weights are also suspended in the centre by a small chain and pulley from the shaft 15; and at one end of this shaft is a ratchet wheel 16, the boss of which has mortices cut in it for the purpose of receiving a small crow or other bar, in order to lift the weight and top rollers when required.

Having described the construction of the first machine called the "deal frame," it only now remains to point out the difference which exists between it and the "*balk frame*," consisting principally in the strength of its construction, with a modification of the mechanism for advancing the timber through the machine, dependent, of course, upon the greater degree of labour to be overcome in cutting or sawing heavy balks or logs of timber, in comparison with "deals" or such light timber.

Fig. 4, represents a front view of the "balk frame" with the engine, shown at the "down stroke," or end of the cut.

Fig. 5, is a side elevation, representing the right-hand side of fig. 4; and fig. 6, is a partial sectional elevation, taken vertically at the dotted lines A, B, in fig. 4.

Now it will be seen that the principal features of novelty in this machine, are the same as have already been described with reference to the deal frame in all its material parts, such as the general arrangement of the mechanism, but being upon a more extended scale, necessarily of a much more powerful construction.

As in the before-mentioned machine, *a, a,* represents the main framing or upright standards of the machine, which are bolted to the foundation and to the flooring *b, b*; *c, c,* is the steam cylinder; *d, d,* the valve box or steam chamber; *e,* the main steam pipe for conducting the steam to the valves through the induction pipe *f,* and which is discharged through the eduction pipe *g,* to the waste steam pipe *h,* as heretofore.

The main driving shaft *i, i,* also carries two fly wheels *j, j,* and the two eccentrics *k* 1, and *k* 2, which are likewise intended to actuate the side valves through the links 5, and shaft 6, and the feeding apparatus or timber carriage by the links 7, 7, keyed upon the shaft 8. The two crank plates *l, l,* carrying the crank pins *m, m,* are also carried round by the ascent and descent of the shaft *n, n,* carrying the frame of saws *o, o,* running up and down in the slides or guide plates *o**, *o**; and this shaft *n, n,* is connected to the crank pins by the side links or connecting rods *p, p,* exactly upon the same plan as the above described machine.

It will be seen that the principal alteration in the arrangement of the machinery in this engine or sawing frame consists in a different mode of advancing the timber to the teeth of the saws, in order that the log or balk may be cut into the required planks or scantlings. This is effected by the following contrivance:—the log or balk of timber is placed upon a framing of woodwork or carriage suitably constructed to receive the same, and shown at 9, 9, and running upon friction rollers placed in bearings bolted down upon sleepers, extending along each side of the machine or sawing frame, and of such a length as the dimensions of ordinary logs or balks may require. This framing or carriage has a toothed rack formed upon its under surface, into which the pinions 10, 10, work: these pinions are attached to a shaft 11, and upon one end of this shaft is a toothed wheel 12, so geared as to give motion to the small pinions; this wheel being keyed upon the same shaft with the ratchet or feeding wheel 13, 13, which is actuated by the ratchet 14, upon the end of the rod or arm 15; and being put in motion by the rotation of the eccentric *k* 2, as before described, thus actuates the whole of the gearing, and causes the timber carriage, and with it the log or balk, to advance in its progress through the machine or sawing frame.

The log, as it advances towards the teeth of the saws, bears upon the anti-friction roller 16, and is kept in its place upon this bearing (that is, prevented from being lifted by the ascent of the saws) by the weighted levers 17, 17, and upright arms 18, 18, carrying the friction rollers 19, 19.

The balk of timber is kept firmly in its place by the grip or holdfast 20, which is securely bolted to the end of the timber carriage, and has a screw and winch for the purpose of adjusting the balk to the centre of the sawing frame.

"I have represented in fig. 4, a diagram drawn in dotted lines, of a mode of opening or dividing a log at the same time another balk is under the operation of sawing in the machine. The log or balk is to be placed upon cross bridles upon the side of the carriage, (or it may run upon a separate carriage,) and there are two wrought iron arms extending from the top and bottom of the frame *o, o*, carrying the system of saws; which arms are designed to carry a single saw to cut or divide the log, and thus prevent the necessity of disarranging the whole series of saws which have been properly adjusted in the sawing frame, when it is only desired to make a single cut. This plan of mounting the saw, may also be very advantageously adopted for the purpose of cutting or sawing veneers, instead of using the ordinary circular veneer saws; and in this case the saw must be attached to a bevelled strengthening plate, as common circular saws for cutting or sawing veneers from timber are generally mounted.

The Patentee concludes by saying, " Having now described the nature of my said invention, and in what manner the same is to be performed, it only remains for me to point out the particular features of novelty. I, therefore, wish it to be understood that I consider, first, the arrangements of machinery for sawing or cutting planks and balks, or logs of timber, as exhibited in the drawing, to be essentially new, and constituting one of the features of my invention. Secondly, I claim the combination of a steam cylinder and piston with the said machinery for the purpose of driving it; and thirdly, I claim the employment of the said machinery as an impelling engine for driving other machinery, or as a sawing frame, separately or combined.

" But I also wish it to be understood, that I do not intend to confine myself to working the piston by steam alone, but mean to embrace also any other elastic vapours or gasses capable of exerting elastic force when applied to effect the objects as described; nor do I mean to adhere strictly to the forms or dimensions of the steam cylinders shown in the drawings, nor to their precise situations, as it will be evident that the cylinder and piston, or driving power, may either be applied over or below the frames containing the saws, and either in a horizontal, vertical, reversed, or any other position which may be preferred, that they may either be stationary, oscillating, or rotatory, according to the pleasure of the operator; but I have shown that which I prefer and consider most applicable to the purpose.—[*Inrolled in the Rolls Chapel Office, December,* 1836.]

Specification drawn by Messrs. Newton and Berry.

To JAMES SMITH, *of Deanstone Works, in the parish of Kilmadock, in the county of Perth, cotton-spinner, for his invention of certain improvements in machinery for carding cotton, flax, wool, silk, and other fibrous materials.*—[Sealed 27th February, 1834.]

THE Patentee describes this invention as consisting in " a more compact and convenient arrangement of the various parts of which a carding engine consists than is generally in use; together with the adaptation and application of a new apparatus by which the flats or top cards are regularly and uniformly stripped and cleared of the cotton or other fibrous materials, motes, and other refuse which they accumulate during the process of carding; which apparatus is put in action by the machine itself, thereby keeping the top cards clear and in working order, without the intervention or attention of the topper or operative who generally performs this duty."

The manner in which these objects are proposed to be carried into effect, will be understood by reference to Plate XI., wherein fig. 1, represents in sectional elevation the several cylinders and other parts of a carding engine in the position in which they are intended to be mounted in the framework. The framework, however, and such of the operative parts of the carding engine, as are well known, are not exhibited, the figure being a diagram exhibiting the novel arrangement of the operative parts.

The driving power is applied by a strap from any first mover to a pulley on the axle of the cylinder *a*, which cylinder is covered with wire cords, and is intended as a breaker to open the fibres of the material previously to their passing to the carding cylinder *b*.

It is proposed that the cotton or other material to be operated upon in this engine, should be previously prepared in a scutching, blowing, and spreading machine in the ordinary way, and be furnished to the carding engine in the form of rolls of lapped fibres as at *c*, *c*. One of these rolls of lapped cotton is to be placed upon a series of small rollers at the back of the machine, and another at the front, in order that the machine may be fed with a double supply of the material.

Without describing the gearing wheels and other mechanism by which the cylinders are all made to revolve, it will be sufficient to say that the end of the sliver or thin fleece is passed from the roll *c*, between what are denominated the feeding rollers *d*; and from thence it is taken by the licker in roller *e*, and thence conducted to the breaking cylinder *a*.

From the breaking cylinder *a*, the cotton or other material is received by the two small carding cylinders *f*, *f*, which feed the large carding cylinder *b*, "turning the fibres," the Patentee says, "over a straight and sharp-edged iron plate, near the points of nearest approach of the cylinders, whereby the fibre is kept straight, being prevented from rolling over."

The cotton or other fibrous material thus carded, is taken from the great cylinder by the doffer cylinders *g*, *g*, in two distinct flues or sheets, and from thence these slivers or fleeces are, in the ordinary way, struck off by doffer combs *h*, *h*, and passed through trumpet-mouthed tubes to the receiving cans, ready for the roving machine.

The top cards (sometimes called flats) instead of being made stationary above the cylinder, are, in this improved construction, attached to endless chains, which move progressively onward; and the spaces between the sides of any two of the top cards are closed by a strap of leather, for the purpose of preventing the dust from escaping.

The endless chains carrying the series of top cards, are extended over the guide pulleys *k*, *k*, *k*, *k*, small studs in the chains dropping into holes in the pulleys; and rotary motion being given to one of these pulleys by a band connected to the driving part of the engines, the chains, with the top cards, will be slowly, but progressively, conducted in the direction of the arrow. The top cards are supported and kept correctly in their places by pins at their ends, bearing in notches in the edges of rims or wheels *l*, *l*, *l*, mounted at the sides of the engine, in situations concentric with the axe of the cylinder *b*.

The top cards, as the engine works, becoming gradually filled by motes and other foul matters, instead of requiring to be removed by hand, as in the ordinary construction of carding engines, are, by the progressive motion of the endless chains, brought round and reversed at *m*, and are there subjected to a rotary brush *n*, which cleans out all the matted fibres and foul matters from the teeth of each card as it passes, and causes them to fall into the trough or receiving box *o*.

The cleaning brush *n*, has two motions—one merely rotary upon its axis, for the purpose of brushing the cards; the other, a crank movement, which causes it to approach to, and recede from, the card. These movements are effected by mounting the axle of the brush eccentrically in a pulley, and giving the movements by a band from the axle of the main cylinder. A vibratory comb is placed under the brush at *p*, for the purpose of cleaning it, and a straight edge, as a scraper to clean the comb, which are worked by suitable mechanism, but not shown in the figure.

The Patentee concludes by saying, " Having now described my improvements in machinery for carding cotton, flax, wool, silk, and other fibrous materials, I shall state that I do not claim, as of my invention, any of the separate or well-known parts or arrangements of machinery which are common to carding engines now in use; but I do claim as of my invention, the peculiar arrangement of the cylinders, as hereinbefore described, whereby the engine is rendered more compact, the carding surfaces more conveniently brought into action, the top cards made self-cleaning, and a greater and more regular produce of carding effected. I also claim as my invention, the application and adaptation of an endless succession of flats or tops, moving round a portion of the periphery of a carding cylinder, both separate and in conjunction with the brushing or cleaning apparatus; which applications for cleaning the said succession of tops, together with the brushing apparatus, I distinctly claim as my invention. And I further claim the invention of tops formed of sheet metal, whereby the evils arising from clearing and warping are prevented. As regards the brushing apparatus, I am fully aware that it may be modified by substituting a brush which does not revolve, in place of the brush shown, and by other arrangements; but the application of a continuously successive brushing or cleaning apparatus to a continuous succession of moving flat top cards, I do claim as my invention, which, as well as the arrangement of the cards, and my other contrivances, may be applied to engines of the ordinary construction.—[*Inrolled in the Inrolment Office, August*, 1834.]

To JOHN YOUNG, *of Wolverhampton, in the county of Stafford, locksmith, for his having invented certain improvements on locks and latches, with regard to the security of the same, and the construction of the interior and exterior parts thereof.*—[Sealed 27th July, 1831.]

THE first subject described in the specification of this patent, is what is called a tumbler lock, but with a novel appendage, denominated a *fly-guard*, which is an extra tumbling lever for the purpose of locking and unlocking the ordinary tumblers.

Plate XI., fig. 2, exhibits the interior of this lock in perspective, in the position in which its parts would be, supposing a false key had been introduced. It is thus described by the Patentee:—" *a, a*, the bolt; *b*, the fly-guard; *c*, its centre; *d*, the fly-guard spring (all on the bolt); *e*, three, four, or more levers; *f*, the centre pin to the levers; *g*, the pin on the bolt. Should either of the levers be raised above its locking position by the introduction of any pick or false instrument, or any key besides the one belonging to the lock, it will lift up the arm of the fly-guard at *d*, and thus, by the assistance of the pointed arm of the fly-guard passing by the pointed end of the spring *d*, cause the guard to fly, and stop against the pin *i*, (on the plate) and take a cross position at the end of the levers *e*. This will show immediately the lock is detected, and at the same time show the great security of the "fly-guard over other locks, for then even its own key will not unlock it till the key is turned, as though it was going to be double locked. The fly-guard and spring will then move along with the bolt, and the guard still pressing against the pin *i*, moves back over the pointed spring *d*, and then can be unlocked by its own key only."

When the bolt *a*, has been thus forced back, the upper end of the fly-guard having passed under the tooth of the spring *d*, the upper arm *h*, of the fly-guard will bear on the top edges of the tumbler levers *e*; and the lower arm *b*, of the fly-guard then standing in a horizontal position, will be enabled to pass into the notch in the tumblers.

Several other modifications of a similar sort of fly-guard or extra tumbler are proposed, as applied to other forms of locks and latches, but which, as they embrace the same leading features, it will not be necessary to exhibit distinct figures of each variety.

A second feature of improvement proposed, consists in forming the bolt of a lock or latch as a right-angled lever, hung upon a pin near its angle, and heaviest at the lower part, so that it shall fall into its holding position by its own gravity; and a third feature is, casting the case of the lock and the staple, straps, or apertures through which the bolt passes in one piece, for the purpose of affording strength, and preventing the lock being opened by any external means short of breaking the lock into pieces.—[*Inrolled in the Inrolment Office, January*, 1832.]

To Augustus Demondion, *of Old Fish-street Hill, in the city of London, in consequence of a communication made to him by a certain foreigner residing abroad, for an invention of certain improvements on guns, muskets, and other fire-arms, and in cartridges to be used therewith, and method of using the same; and in machinery for making the said guns, muskets, and fire-arms; also the cartridges and priming; which improvements are also applicable to other purposes.*—[Sealed 13th July, 1831.]

The Patentee appears to presume that the English nation have but an imperfect idea of the construction of a musket; and has, under this impression, given us in detail figures drawn at the full size of every part or individual piece of which a musket is constructed, as well as of many of the tools by which they are to be manufactured. These, with a very copious description of the drawings, comprehending forty-nine shaded and coloured figures, the explanation of which occupies many skins of parchment, constitute the specification of the invention, which we hope to render evident without any such elaborate treatise.

The improvement consists in loading the gun at the breech; and in order to effect this, the breech part of the barrel opens by raising a lever in the situation of the breech pin, which carries a part of the breech. When this lever, which turns upon joints in side plates, is raised, the breech end of the barrel is removed, and the cartridge may be introduced: when that is done, the lever is shut down upon the small of the gun, which closes the end of the barrel; and it is made fast by a spring catch in the end of the butt.

The cartridge is made up in a cylindrical form with powder and shot, and the copper cap, containing the detonating composition, is inserted into the back end of the cartridge. On shutting down the breech pin lever, a solid piece of steel, as a small anvil, is brought close against the side of the detonating cap and an up-striking hammer, which is impelled by a strong spring placed against the guard, when let off by the trigger, strikes the side of the detonating cap with sufficient force to crush it against the anvil, and thereby discharge the piece.

The same contrivances are proposed as applicable to other fire-arms, such as fowling-pieces, pistols, &c.; but no further description of their adaptation is given, the foregoing being considered sufficient.

A mode of attaching the bayonet to the end of the musket is described consisting of a socket fixed to the end of the barrel, into which a piece at the stem of the bayonet is to be inserted, and held fast by a spring.

The only claim of novelty proposed is the arrangement as shown and described.—[*Inrolled in the Inrolment Office, January,* 1832.]

To RICHARD ELSE, *of the city of Bath, gentleman, for certain improvements in drying malt.*—[Sealed 7th September, 1833.]

THESE improvements consist in applying what the Patentee denominates a reticulated cylinder to drying malt, instead of the mode usually employed. The apparatus, described in the specification, is shown in Plate XI., fig. 3, which represents an end view of the reticulated cylinder, consisting of hoops of iron *a, a,* placed a suitable distance from each other, and having a wire gauze covering extended over them.

The cylinder has longitudinal recesses *b*, *b*, extending along it, for the purpose of forming butts or ledges for turning over the grain as the cylinder revolves; the ends of the cylinders consist also of wire gauze, and are made moveable for the admission of the malt that is to be dried into the interior of the cylinder. The malt is to be put into this apparatus in the state in which it is, when considered to be ready for the kiln in the ordinary process.

This apparatus, when in use, must be enclosed in a hot-air chamber, and be kept slowly revolving, which may be done by hand, or any other motive power. It will be perceived that, as the cylinder revolves, the surface of the malt, which is exposed to the action of the heated air, will be kept continually changing its position, owing to the obstruction caused by the recesses *b*, *b*.

The principal advantages derivable from these improvements are, drying the malt more uniformly, and with greater expedition than by the ordinary mode.

The Patentee concludes by saying, " that what he claims as his invention is, the applying of a reticulated cylinder, such as is above described, to the drying of malt."—[*Inrolled in the Inrolment Office, March,* 1834.]

To WILLIAM AUGUSTUS HOWELL, *of Ramsgate, in the county of Kent, smith and ironmonger, for his invention of certain improvements in the construction of springs for doors.*—[Sealed 3rd May, 1836.]

THIS invention of certain improvements in the construction of springs for doors, applies both to double and single action door springs; the former construction allowing the door, to which they are attached, to open and shut in either direction; the latter allowing the door to open and close only on one side, the door shutting against a jamb or fixed part. The object of these improvements are, first, the constructing of a piece of mechanism in such a manner that the leverage shall command the power or force of the spring, and cause it to hold the door firmly after it has been closed, and prevent its being blown open by wind; yet allowing it to yield easily to the push, after the door has been started from the closed position. This is effected, in the first instance, by a peculiarly-shaped eccentric rolling lever, acting upon the spring, in conjunction with an anti-friction roller; and, in the second instance, by snail levers or eccentric rollers and chains, which act upon the spring, and present different radii or leverage in different parts of the movements of the door; the longer or more favourable radii or leverage coming into operation as the spring is becoming compressed or brought into greater tension, the wider the door is opened; and the shorter or most unfavourable radius of the levers is presented to the spring when the door is closed, so that, although the spring is really becoming stronger as the door opens, and offering more resistance to the push; yet it is not so sensibly felt by the person opening the door, as the more favourable radii or leverage is then brought into operation upon the spring.

"Secondly, my improvements have for their object the construction of a mechanism for single-action door springs, which prevent the quick return or slamming of the door against the jamb or door post when let go after it has been opened, thereby obviating the nuisance of the jar and noise. This is effected by causing the expanding or returning power of the spring to be retarded and commanded by a governor, which will partially overcome the force of the spring, and cause the door to close gently; the retarding mechanism not offering any opposition or resistance to the door in opening, but beginning to act immediately after the door has been let go, so as to prevent the quick expanding of the spring, and consequently the slamming of the door against its jamb or stop.

"The several figures in the accompanying drawings are representations of different constructions of my improved door springs.

"Plate XIV., fig. 1, is a plan or horizontal view of the first construction of my improved double-action door springs, having a cam or eccentric and anti-friction roller acting upon the spring, the upper plate or cover of the case being removed to expose the interior, the position of the parts being in the quiescent state, or as they are when the door is closed. Fig. 2, is a similar view, the parts being in the position they are when the door is opened. Fig. 3, is a vertical section taken through the case, showing part of the door and flooring: *a, a*, is the box or case, formed of cast iron or other metal; *b*, is the centre pin on which the door turns, and carrying the eccentric *c*, the upper part of this pin fits into a square socket in the shoe piece *d*, securely fastened to the lower part or heel of the door in any convenient manner; *e, e**, is the spring, the one part *e*, pressing against the side of the case, and held by a steady pin; the other part *e**, pressing against the end of the sliding piece *f*, and is also held thereon by steady pins: the piece *f*, works in a groove or recess in the case, and carries the anti-friction roller *g*, against which the cam wheel or eccentric *c*, of the centre pin works.

"It will be seen, on inspecting the figures, that there is a notch or recess *h*, cut out of the eccentric at its smaller radius, into which the roller *g*, fits when the door is closed, the centre of the roller approaching the centre of the pin; and there must be sufficient power applied to the door, on opening it, to force the roller out of the notch, and as soon as it arrives on the periphery of the cam or eccentric, the further compression of the spring, as the door is opening, will be easily accomplished, as the longer radii of the cam passes opposite or in contact with the friction roller. On the door being let go, the force of the spring returns the parts into the former position, and the roller enters the notch of the eccentric, and holds the door closed.

"Fig. 4, is a similar view to fig. 1, of another of my improved constructions of double-action door springs, with a coiled or barrel spring, and in which the first object of my improvements are further carried into effect, viz. the cams or eccentrics presenting different radii or leverage to overcome the power of the spring at different parts of the motion of the door. Fig 5, is another similar view, showing the parts as situated when the door is opened; and fig. 6, is a vertical section: *a*, *a*, is the case; *b*, the centre pin of the door, which carries the two eccentrics *c*, *d*, connected by chains to the coiled or barrel spring at *e*, the one eccentric *c*, being connected by the chain *f*, to the snail cam or eccentric *g*, attached to the barrel *e*, of the spring, which turns loosely on the axle *h*, of the spring. The other eccentric *d*, is connected by the chain *i*, to another eccentric *l*, mounted on to the lower end of the axle *h*, of the spring barrel, one end of the coiled spring being attached in the usual manner to the interior of the barrel, and the other end to the shaft or axle. The operation of the spring will be seen by inspecting the drawings, and comparing the situation of the parts as shown in figs. 4, and 5.

"The door being closed, and in the position of the dotted line in fig. 4, it will be seen that the chains *f*, and *i*, pass from the spring over the smaller radii of the snails *g*, and *l*, that is in the least favourable position, to allow of the spring being coiled up, or brought further into tension on any force being applied to the chains *f*, or *i*; for instance, by the eccentrics *c*, or *d*, being turned with the door in opening either way; but, as soon as the door has been moved from the closed position, the larger or increasing radii of the snails or cams *g*, and *l*, will come into action, the chains being uncoiled therefrom; at the same time, the lesser radius of the eccentric *c*, will be brought into operation, the chain coiling on the periphery thereof, and the parts will assume the position shown in fig. 5. On the door being let go, the springs will immediately uncoil, and bring the parts into the quiescent position shown in fig. 4, and close the door. There are proper stop pieces *m*, and *n*, placed on each chain, which come against stationary stops or abutments *o*, and *p*, fixed at the side of the case or box, which cause the door always to be brought into the right position when closed.

"Figs. 7, 8, and 9, are representations of one of my improved constructions of springs, with the mechanism attached thereto for obtaining the second object of my improvements, viz. preventing of the slamming to of the door when let go after being opened. Fig. 7, is a plan view, showing the interior, the plate or cover being removed, and the parts shown in the position they are in when the door is closed. Fig. 8, is another similar view, taken after the door has been opened. Fig. 9, is a vertical section of the spring box or case. The construction of the parts of the spring for communicating the motion of the door to the spring, and from the spring to the door, are the same as that just above described and shown in figs. 1, 2, and 3, of the accompanying drawings, and have corresponding letters of reference marked on the same parts, therefore no further description of this part will be necessary. Upon the centre pin *b*, of the door is mounted the small cam or eccentric *o*, to which is attached the chain *p*, connected at its other end to the cam or eccentric *q*, mounted on the centre pin or shaft *r*. There is another eccentric or cam *s*, also mounted on the centre pin *b*, to which is attached the other chain *t*, and connected at its other end to another eccentric or cam *u*, also mounted on the axis *r*, and revolving with it; *v*, is a ratchet wheel, also placed on this shaft; *w*, is a spur wheel, turning loosely on the axle *r*, and carrying palls or clicks *x*, which are kept pressed towards the teeth of the ratchet by springs, in the usual manner. The toothed wheel *w**, takes into an endless worm or screw *y*, the axle of which turns in proper bearings, and carries at its other end the worm wheel *z*, which takes into another worm or endless screw 1, on the upright shaft 2, which carries upon its upper end the retarding flyer or expanding governor, shown detached in two views at figs. 9, 10, and 11; fig. 10, showing it in the quiescent position as it is when the door is closed; fig. 11, showing it in action and expanded, as when the door is closing. The retarding governor consists of a plate 3, mounted on the end of the axle 2, and carrying the expanding pieces or wings 4, 4, which turn loosely on pins or studs 5, 5, and are connected together by arms or levers 6, 6, and the rod 7; 8, is a coiled spring, attached at one end to the plate 3, and at the other end to one of the pieces or wings 4. The operation is as follows:—On the door being opened, the centre pin *b*, is turned, by which the cam *o*, is made to draw the chain *p*, from off the eccentric *q*, and carry round the axis *r*, and with it the ratchet wheel *v*, in the direction of the red arrow, the palls *x*, *x*, giving way to its motion, the eccentrics *s*, and *u*, with their chain *t*, being also put into motion by the same means, but at this time merely transferring the chain from one to the other; but the moment the door is let go, the spring *e*, exerts its force to cause the door to close, and the various parts to turn the reverse way, in the direction of the black arrow; which action immediately causes the cam *s*, by the chain *t*, to draw round the eccentric *q*, and turn the ratchet wheel in the reverse direction to that when opening the door, and the ratchet wheel by means of the palls or clicks *x*: these parts, being now in connexion with the screw wheel *w*, cause it to be set in motion, and, consequently, turns the worm *y*, with its shaft and wheel *z*, and this latter gives motion to the other worm 1, shaft 2, and the retarding governor; which, as it acquires velocity as the door is closing by the expanding or return action of the spring, the centrifugal force of the pieces or wings 4, 4, overcomes the force of the coiled spring 8, and they expand, as shown in fig. 11, and thereby offer a more extended surface, or greater leverage to the resistance of the atmosphere; and, by thus partially overcoming or counterbalancing the expanding power of the spring *e*, retards or obstructs the return of the door, and prevents it shutting quickly and slamming; and as soon as the door has shut against its jamb, the parts assume the quiescent position as in fig. 10.

"Figs. 12, and 13, are representations of another of my improved construction of door springs, in which the parts for communicating the motion of the door to the spring, and from the spring to the door, is of the construction second above described, that is, with the coiled or barrel spring; and the same letters of reference being marked upon corresponding parts, the foregoing description will be sufficient to explain this part of the mechanism; and as the retarding motion is similar to that just above described, therefore, no further description will be given, the same letters of reference being marked upon corresponding parts to the former.

"Having now particularly described and ascertained the nature and object of my invention, I would remark that I recommend the box or case of the spring to be filled with oil, not only for the purpose of reducing friction, but also to deaden the noise caused by the working of the mechanism; and I have, therefore, used worms, and endless screws, and wheels with oblique cut teeth, in preference to ordinary toothed wheels, as the former work more smoothly together, and make less noise in working than the latter.

"And further, I would remark, that I do not mean or intend to claim, as my invention, any of the parts separate, as some of them have been heretofore used for a like purpose; neither do I intend to confine myself to the precise forms or dimensions above described and shown in the drawings; as different sized springs, having greater or less power, will be required for different sized doors. Neither do I intend to confine myself to any particular dimension or construction of retarding mechanism herein described, as that may be varied and arranged at pleasure: my improvements consisting in, and what I particularly claim as my invention being, first, the improved combination of double-action door springs, as above described and shown in figs. 1, 2, and 3, of the accompanying drawings, consisting of the eccentric or rolling lever mounted on the centre pin of the door, the anti-friction roller, its sliding piece, and the spring; secondly, in the improved construction of double-action door springs as above described, and shown in figs. 4, 5, and 6, in which the force or power of the spring is, by the positions and combinations of the various eccentrics or snail levers, opposed to the opening of the door when it is closed; but when the door is once started in opening, assuming positions which are more favourable for overcoming the power of the spring. And further, I claim, as my invention, the application to door springs of commanding or retarding mechanism, set in motion by the expanding or returning force of the spring, which would otherwise be exerted to cause the door to close quickly and slam against its jamb; this commanding mechanism being intended to take up the surplus power of the spring at that time of expanding."—[*Inrolled in the Rolls Chapel Office, November,* 1836.]

To JOHN HYDE, *of Ashton-under-Lyne, in the county of Lancaster, cotton manufacturer, for his invention of improvements in machinery for carding cotton and other fibrous substances.*—[Sealed 31st December, 1835.]

THIS invention of an improved carding machine is described as consisting in a saving of the strips of cotton, or other material worked therein, inasmuch as such strips of cotton or other material will be equal or superior to the cotton or other material when first put into the carding engine, all the motes and short fibres being taken from the strips, leaving them pure and clean, so much so, that when put into the engine and worked again, will produce a superior quality of carded cotton, or other carded material, which is effected by the method in which the cotton or other carded material is cleared from the flat or card in a cleaned state, and leaving the dirt or refuse in the card, which dirt or refuse is cleaned out as it progresses onward, and is then deposited in a box separate from that in which the clean strips are deposited.

By this improvement there is a great saving in cards, they not being liable to be injured by stripping, cleaning and grinding, as they are upon the old principles; there is also much less fly or waste made. Another advantage is effected by the great superiority of the carding over the common method, inasmuch as the fibres of the carded material are laid so straight, that in using most qualities of cotton, drawing frames may be dispensed with, as each of the described parts of the invention execute their several parts so accurately, that the machine or carding engine requires little or no attention, except the common method of supplying with material.

Plate XII., fig. 18, shows a portion of the large cylinder of a carding engine A, A, A. On the upper side of this are placed the flats or top cards *a*, *a*, *a*, which are to receive the cotton from the large cylinder, for the purpose of opening and straightening its fibres. These top cards, instead of being stationary, as in ordinary carding engines, are connected in a continued series to endless bands passed over tension pulleys *b*, *b*, and a guide bead or curved rabit *c*, *c*, *c*, and are intended to be carried along by a slow progressive movement in the direction of the arrow, for the purpose of taking those flats or cards out of operation which have become filled with the entangled filaments of cotton, submitting them to a cleaning brush, and afterward bringing the cleaned cards of the endless series progressively into operation at the opposite part of the engine.

The cleaning brush *d*, is cylindrical, and formed upon an axle mounted in the framework of the machine, just above that part of the series of cards where they rise up from the large carding cylinder. The brush receives a rapid rotary motion, and the top cards a slow one, by means of any convenient gear connected to the axle of the large cylinder; and hence, as the cards *a*, severally rise and are turned over, the brush *d*, draws out all the dirt and entangled fibres of cotton from between the teeth or points of the cards as they pass under it.

A comb *e*, having a double row of points, is intended to act in the brush for the purpose of clearing it from the fibres of cotton; and another comb *f*, having a single row of points, cleans the comb *e*. These two combs *e*, and *f*, receive reciprocating movements by means of any convenient mechanism not shown in the figure, for the purpose of first introducing the comb *e*, into the rotary brush *d*, in order to comb out the foul materials, and then bringing the two combs *e*, and *f*, together, so that the comb *f*, may take the material from the comb *e*, and deposit it in a receiving box *g*, which operation is assisted by a spring scraper *h*.

The Patentee says in conclusion, "Having now described my improvements in machinery for carding cotton and other fibrous substances, I shall state that I do not claim, as my invention, any other separate or well known parts or arrangements of machinery which are common to carding engines now in use; but I do claim, as my invention, each and every part hereinbefore, and in the plan hereto annexed described; and my invention, and the several arrangements thereof may be applied either to old or new engines of the ordinary description."—[*Inrolled in the Inrolment Office, May*, 1836.]

To WILLIAM MAUGHAN, *of Newport-street, Lambeth, in the county of Surrey, chemist, for his invention of certain improvements in the production of chloride of lime, and certain other chemical substances.*—[Sealed 22nd March, 1836.]

THE Patentee commences his specification by stating that, in the ordinary manufacture of the chloride of lime or soda from muriate of soda (common salt), the soda is, in a great measure, sacrificed in obtaining the muriatic acid which is to supply the chlorine in that manufacture while in the ordinary manufacture of carbonate of soda, which is also obtained from muriate of soda, the muriatic acid is lost by being permitted to escape into the atmosphere. Now, this invention relates to the application in the manufacture of chloride of soda, or soda of the muriatic acid gas evolved by the decomposition of common salt, by means of sulphuric acid in the first process of the ordinary preparation of carbonate of soda, whereby sulphate of soda is produced; and my invention also relates to converting sulphuretted hydrogen gas, which is copiously evolved in certain chemical processes, into sulphuric acid.

Plate XI., fig. 4, represents a section of the apparatus: A, is a pipe communicating with the retorts or vessels in which muriatic acid, in a state of gas, is evolved from the mixture of common salt or muriate of soda, with sulphuric acid in the first process, in manufacturing carbonate of soda in the ordinary way. The pipe A, is inserted into a cylinder of iron or other suitable material B, C, which, after being filled with black oxide of manganese, broken into tolerably sized fragments, is closely luted down at its upper extremity B. The manganese is prevented from falling below the point C, by a perforated metallic diaphragm I, at which point I, the cylinder D, is attached to the cylinder B, C. The end of the cylinder D, is inserted air-tight into the close vessel E, F, into which water is placed to about the depth of an inch, which height is regulated by the bent tube S, the opening at S, being so regulated, that any greater depth of fluid in the vessel E, F, shall be discharged at S, the surface of the fluid being designated by the letters *a*, *a*: L, L, is a pipe inserted in the top of the vessel E, F, which, at its extremity, communicates with the chamber M, M. This chamber M, M, is traversed in its length by two or three diaphragms of platinum wire gauze, represented by the dotted lines. Out of the chamber M, M, proceed tubes N, N, N, of platinum, or other suitable material (not prejudicially acted on by the operation), traversing any convenient furnace R, R, whereby they are kept constantly at a red heat. The tubes N, N, N, at their other extremity, all communicate with the pipe O, O, whose open end is immersed about one inch in water contained in a close vessel P; from the top of the vessel P, a pipe Q, issues out, which communicates to the ordinary apparatus used for saturating lime or soda with chlorine: K, is a pipe, with a stop cock inserted in the cylinder B, C, at its upper end, communicating with any convenient reservoir of water: G, G, is a jacket of metal encasing the cylinder B, C, for nearly its whole length, through which, by means of the tubes H, hot water may be made to circulate by being introduced at the tube H, at the upper end of the jacket G, G, and suffered to flow out at the tube H, at the lower end of the jacket, and thus maintain the cylinder B, C, and its contents at any desired temperature below that of boiling water. The apparatus thus arranged, a small stream of water is made to flow constantly over the manganese, by opening sufficiently the cock on the pipe K, the manganese being kept, by means of the circulation of hot water through the jacket G, G, always at a temperature of not less than one hundred and thirty degrees of Fahrenheit: the object of this temperature being to prevent the formation of euchlorine gas, which is produced during the process at a temperature much below one hundred and thirty degrees of Fahrenheit. This being premised, muriate acid gas is suffered to enter into the cylinder B, C, through the tube A, which muriatic acid gas traverses the moistened and heated manganese in the cylinder B, C, by which the greatest portion will be converted into chlorine: the gas, following the direction of the arrows, passes through the perforated bottom or diaphragm I, into the cylinder D, and bubbles up through the liquid into the upper part of the vessel E, F, being conducted through the pipe L, L, through the perforated diaphragms in M, M, and the tubes N, N, N, where, if any free hydrogen gas has been generated, combustion of that gas ensues; but which combustion will be prevented from operating backwards, by the wire gauze diaphragms in M, M, which are placed there for safety. After passing through the tubes N, N, N, the gas continues its course through the pipe O, O, where the water in the vessel P, will condense any muriatic acid which may have been formed by any combustion just mentioned in the tubes N, N, N, and also any which passes over without being decomposed; and thus free, the chlorine is conducted by the pipe Q, to the apparatus in ordinary use for saturating lime or soda with chlorine. Provision will, of course, be made to collect any fluid which, in the course of the process, may flow out of the pipe S, the object of which pipe is to prevent any stoppage in the process by an accumulation of water flowing into the cylinder B, C, from the pipe K; and which water will be impregnated with a portion of muriate of manganese, formed by the solution of the manganese, by that portion of the muriatic acid gas which, in its passage through the moistened manganese, is not converted into chlorine.

The second part of my improvements consist in the conversion of sulphuretted hydrogen gas, which is copiously evolved in certain chemical processes into sulphuric acid; and, for this purpose, I employ the following apparatus, reference being again had to the drawing hereunto annexed:—Figs. 5, and 6, upon the plan, represent this apparatus; fig. 5, being a front or cross section, and fig. 6, a longitudinal section thereof; and the same letters are used in figs. 5, and 6, to designate the same parts of the apparatus: A, B, C, is a closed chamber of any suitable material, in form like a muffle, and closed at both ends. This chamber is traversed by three cylinders I, K, L, similar to each other, which are all seen in fig. 5; but only one L, L, is shown in fig. 6; I, being hid, and K, being supposed to be removed.

These cylinders are each divided internally by a series of partitions into several chambers M, M, M, &c., and in the plan are divided into eight chambers. Out of each chamber M, issues a jet *b*, and thus, in the plan, each cylinder I, K, L, having eight chambers, there will be in all twenty-four chambers and twenty-four jets. The number of chambers and jets is not material, but should be increased or diminished according to the quantity of gas to be consumed, as hereinafter described. Into each of the chambers M, M, &c. of the three cylinders I, K, L, are inserted two tubes *d*, and *g*; the tubes *d*, issue out of one of the pipes N, N, and the tubes *g*, out of one of the pipes O, O, which are placed below the vessel A, B, C. These pipes N, N, which are closed at the end, communicate at the other end with a gasometer, containing atmospheric air or oxygen gas produced from black oxide of manganese, and, consequently, are intended to convey into each chamber M, by each tube *d*, a stream of atmospheric air or oxygen gas (as the case may be); and the pipes O, O, which are also closed at the end, are connected with any vessel from which sulphuretted hydrogen gas is passing during any process in which that gas is generated. Above the jets *b*, *b*, &c., a tube D, D, of platinum, or other suitable material, traverses the vessel A, B, C, and all the jets *b*, *b*, &c., are directed towards the tube D, so that any flame issuing from the jets *b*, *b*, &c., may play upon D, so as to envelope it by these flames, and keep it red hot. One end of the tube D, D, is to be connected with the aperture E, in the vessel A, B, C, by means of the curved piece D, E. The other end of D, D, is to be connected with the pipe F, the end of which is inserted in a leaden vessel G, with water, and the cock H, serves to draw the fluid out of the vessel G. In the curved piece D, E, is inserted the tube R, S, having a stop cock X; and the other end of R, S, is inserted in one of the pipes N. The apparatus being thus adjusted, the sulphuretted hydrogen gas passes through the pipes O, O, and into the several chambers M, by means of the tubes *g*, at the same time that atmospheric air or oxygen gas (as the case may be), passes through the pipes N, N, also into the several chambers M, by means of the tubes *d*; thus forming an inflammable mixture of gases, which issue, thus mixed together, out of the several jets *b*, *b*, &c., to which a light is to be applied, which is effected by removing the covering T, from the opening in the vessel A, B, C, and which is to be closed air-tight as soon as the mixture is inflamed, and the quantities of sulphuretted hydrogen gas, and of atmospheric air or oxygen gas are to be adjusted, according to the mode described for the combustion of oxygen and hydrogen gases in my paper on a blow-pipe, contained in the "Transactions of the Society of Arts," for 1835. In the covering T, may be inserted a bit of mica or glass, to show the state of the flames. The chief product of the combustion thus effected is sulphurous acid gas, which cannot escape out of the vessel A, B, C, except by the pipe at E, through which it is conveyed into D, where it meets with a stream of atmospheric air or oxygen gas (as the case may be), let into D, through the pipe R, S, and regulated by the stop cock X ; and, thus mixed, the gas passes through the pipe D, where it is kept red hot by the flames from the jets *b*, *b*, &c., and thereby is converted into sulphuric acid vapour, and, passing through the pipe F, is condensed by the water contained in the vessel G, and thus sulphuric acid is obtained. As considerable pressure is necessary to force the sulphuretted hydrogen gas through the jets, to be burned with atmospheric air or oxygen gas, it will be better to collect the sulphuretted hydrogen gas from whatever source produced, and also, the atmospheric air or oxygen gas into gasometers or gas-holders, after the manner in which coal gas is collected for use; and then to convey those products from such reservoirs to the apparatus above described, by connecting the pipes O, O, with the outlet pipes of such gas-holders or reservoirs.

The Patentee says that, in these improvements, he does not claim any part of the process for obtaining carbonate of soda, nor the saturation of lime or soda with chlorine, nor the method of converting muriatic acid gas into chlorine, by passing it over moistened black oxide of manganese, "but I claim as my invention, the exclusive use of these three operations continuously united together; viz. the production of sulphate of soda from common salt, the conversion of the resulting muriatic acid gas into chlorine by passing it over moistened manganese, and the subsequent production of chloride of lime, when effected in an apparatus combining such an arrangement as shall permit the liquid muriate of manganese to flow away as fast as it is formed, as shall keep the moistened manganese at a degree of temperature greater than what is sufficient to explode euchlorine gas, and as shall permit the chlorine to pass over a red hot surface as fast as it is formed. To neither of these operations singly do I lay claim, but to the whole, when used in combination; and that, whether effected by the apparatus described, or any modification thereof; and, furthermore, I claim such combination without reference to the apparatus, by which the common salt shall be converted into sulphate of soda, or that by which the produced chlorine is to be converted into chloride of lime. The principle of this part of my invention being, to turn to profitable account the muriatic acid gas now suffered in the manufactories of carbonate of soda from common salt, to escape into the atmosphere.

"Secondly, I claim, as my exclusive right, the process of converting sulphuretted hydrogen gas, which is evolved copiously during certain chemical processes, into sulphurous acid, by mixing it previously with a sufficient dose of oxygen, however procured, and burning it in a closed chamber from a series of jets; and this I claim, whether the sulphurous acid so produced be converted into sulphuric acid in the ordinary way, by means of nitrate of potash, or by being passed, with an additional dose of oxygen, through a red-hot tube.

"Thirdly, I claim, as my exclusive right, the formation of sulphuric acid by the combustion of sulphuretted hydrogen gas from jets set in closed vessels, from whatever source that gas may be produced.

"Fourthly, I claim, as my exclusive property, the formation of sulphuric acid, by passing a mixture of sulphurous acid and oxygen gases through a red hot tube or tubes, heated by the combustion of sulphuretted hydrogen, from whatever source produced."—[*Inrolled in the Inrolment Office, September,* 1836.]

To Ralph Watson, *of York-place, Portman-square, in the county of Middlesex, Esq., in consequence of a communication made to him by a certain foreigner residing abroad, for an invention of a certain improved lamp.*—[Sealed 23rd February, 1832.]

The Patentee describes his invention in nearly the following words:—"The burner of the improved lamp is of the kind usually called an Argand burner; that is, it consists of a hollow circular cotton wick, enclosed in the annular space between two concentric tubes, which annular space is supplied with oil from the oil reservoir; the internal surface of the wick being fed with a current of atmospheric air passing up through the inside of the internal tube, and the external surface of the wick being also supplied with a current of atmospheric air surrounding it within the glass chimney. In the Argand burners, commonly in use, the external tube and the internal tube are soldered together at the lower part, in order to make an oil-tight channel for the oil in which the wick is immersed, as is shown in fig. 19, Plate XII. which is a section of a common Argand burner. The wick is fitted upon a small piece of tube 1, which is enclosed within another tube 2; and this second tube fits over the internal tube *b*, of the burner, and has a vertical slit in it, into which a pin *c*, projects from the outside of the wick tube 1, and another pin on the inside of the wick tube takes into a spiral groove on the outside of the internal tube. The carrier tube 2, has a ring or framework *d*, soldered on its upper end to turn it round by, in order to raise or depress the wick; and the ring *d*, rests on the top of the external tube. One defect of this plan is, that by having two holes within the annular space destined for the oil, that space is necessarily made too wide; and the wick is not placed so as to receive the internal and external currents of air with the greatest advantage; for the wick is usually placed near to the internal tube, the thickness of the carrier tube 2, intervening between it and the external tube, and hence it is not fed with so active a current of air externally as internally: the annular space being, in fact, much wider than the thickness of the wick, the latter cannot be so perfectly enclosed between the two currents of air as it ought to be. Another defect is, that as the ring *d*, rests on the top of the external tube of the burner, the oil in the annular space is considerably below the level of the top of the tube, whence the wick is not properly supplied with oil, because the capillary attraction will not draw the oil up into the wick more than a certain height, and so the wick is obliged to be burned too close to the heated metal, and after a time becomes charred, and causes the flame to diminish in brilliancy. In the improved lamp, represented in fig. 20, the internal and external tubes are not soldered together, but are fitted together, at their lower ends, so as to form an oil-tight joint, and yet to be capable of being turned round freely one on the other. In the improved lamp, represented in fig. 20, a conical plug *c*, is formed on the lower part of the internal tube *b*, see figs. 21, and 22, which is ground very truly, and fitted into a corresponding conical seal formed in the lower end of the external tube *a* : hence, when the latter is placed on and fitted over the former, it presses down upon it, and forms a tight fitting, like the fitting of a common cock into its conical seat; the reservoir and all the upper parts of the lamp being attached to the external tube *a*, and tending by their weight to press the two conical surfaces into closer contact with each other, and so to make the fitting quite oil-tight, if the work be properly executed. A small groove is formed in the lower end of the conical plug *c*, at *d*, see fig. 21, and a corresponding pin *e*, is fixed to the lower edge of the external tube; which pin, when the external tube is fitted over the internal tube, enters into the groove *d*, and catches under the lower end of the plug *c*, so as to prevent the external tube from being drawn up off its plug *c*, but to permit it to be turned freely round upon it. Instead of the groove *d*, and pin *e*; a couple of small screws *x*, *x*, fig. 21, may be screwed through ears *y*, *y*, formed on the lower end of the tube *a*; when screwed in, with their ends under the cone, as in fig. 21, they will prevent the tube *a*, being lifted up, but will allow it to be turned round freely. When the tube *a*, is to be taken off to clean the burner, the screws *x*, *x*, must be turned back, so as to be clear of the conical plug. The wick is fastened, in the usual way, on a small tube *i*, see fig. 23, which has a pin *g*, projecting from its outer surface; taking into a vertical groove in the external tube, and another pin *l*, on its internal surface, taking into a spiral groove *m*, formed on the outside of the internal tube.

To raise or lower the wick, the upper part of the lamp is to be turned round upon the conical plug of the internal tube, by laying hold of one of the branch pipes *c*. The edge of the vertical groove, in which the pin *g*, enters, will compel the wick tube *i*, to move round with the said external tube, rising at the same time by means of the spiral groove *m*, all which parts are sufficiently obvious, by inspection of the drawing, to persons conversant with the parts of lamps, to require no further description.

By this method of making the external and internal tubes of the burner in two independent pieces, one of which can be turned round upon the other to raise the wick, I am enabled to dispense with a separate carrier tube for carrying the wick tube, and, consequently, with a given size of burner, the annular space for the oil may be made narrower than usual. Hence the wick can be placed, as it ought to be, close to the external tube, and be at the same time close to the internal tube, so as to be enclosed between two sheets of atmospheric air, and be more perfectly fed therewith than in lamps in which the said annular space for the oil has to contain two tubes. Also, by lifting the external tube up off the internal one, the interior of the burner is accessible for cleaning the same.

The reservoir is placed above the top of the burner, as shown by the drawing, and is adapted to maintain the oil always at the same level in the burner, as long as there is any oil left in the reservoir. It is formed of two parts; a broad flat tray or annular channel A, A, to which the branch pipes C, are soldered, and a reservoir B, B, fitting into the tray. From the lower side of the reservoir B, two short pipes *n*, *n*, descend, so that when the reservoir is placed in the tray A, the pipes *n*, *n*, enter a little way into the pipes C, but they are of less diameter than the pipes C, so that the external air can get into these pipes *n*, *n*, when their mouths are uncovered, between the tray and the reservoir, and round the annular space left between the pipes *n*, and the pipes C, see fig. 20; the reservoir B, being made to fit only loosely into the tray for that purpose. To fill the reservoir, it is taken out and inverted, and oil is poured into one of the pipes *n*, through a small funnel. The air that is contained in the reservoir will escape out of the opposite pipe *n*, until the reservoir is full, which will be shown by oil issuing out at that same pipe *n*. The reservoir is then to be turned round, keeping the orifices of the pipes *n*, closed with the fingers, and placed in the tray; and if, in doing so, the orifice of one pipe be kept still closed by the finger, while the other pipe *n*, is inserted into one of the pipes c, and then the former be put quickly into its place, hardly any oil will escape into the tray.

When the reservoir is placed, as in fig. 20, with both pipes *n*, entering into the pipes c, the oil will flow down from the reservoir B, through the pipes *n*, and c, and rise up in the burner as high as the level of the lower ends of the pipe *n*, an equivalent quantity of air getting into the reservoir, through the pipes *n*, to occupy the space of the oil that flows out.

When the pipes c, and reservoir are full up to a little above the mouths of the pipes *n*, no more oil will pass out of the reservoir, because the mouths of the pipes *n*, being closed by the oil, no air can get into the reservoir, and the oil is, therefore, retained therein by the pressure of the atmosphere. The oil will also always stand in the burner as high as the level of the mouths of the pipes *n*, during the burning of the lamp, as long as any oil remains in the reservoir; because, when any portion of oil is drawn up into the wick, and consumed in the combustion, the oil in the pipes c, will sink a little below the level of the mouths *n*, and partially uncover them; then air will get in at those pipes, and pass up into the reservoir, and so allow a corresponding portion of oil to flow into the pipes c, and into the burner. The principle and operation of this mode of supplying a burner, so as to keep the oil always at a given level, are the same as in the ordinary fountain lamp, and being well known to lamp makers, need not be further described.

"The chimney is shown in fig. 20; it is nearly cylindrical, like the burner of a gas lamp, but not quite; viz. it is slightly tapering, the diameter at the bottom being a little less than at the top. I prefer this form to that in common use, because it produces a better directed draught of air around the wick, for the bend that is usually made in the chimney of a lamp, as shown in fig. 19, tends to throttle the current of air just where it meets the flame, and has thereby an injurious effect on the combustion proper for producing a brilliant light. Also a chimney, of the shape shown in fig. 20, viz. slightly conical, the largest end being at the top is less liable to break from the heat than a chimney, cylindrical from the flame upwards. The chimney is placed in a tube *k*, into which it fits tight; and inside of that tube, a smaller concentric one is fixed, by small arms or plates, which is of a proper size to fit tightly on the external tube of the burner; but yet it can be slided up and down upon it, to shorten or lengthen the chimney, according to the state of the atmosphere or the quality of the oil; for sometimes an addition to, or diminution of, the length of the chimney, will materially influence the burning of a lamp. I sometimes make the lower part of the chimney of the shape shown by the dotted lines, fig. 20, whereby the tendency of the flame to flare up through the chimney, when the air is agitated in the vicinity of the lamp, is diminished. The lower part of the tube *b*, is soldered into a brass cup *p*, with holes around its upper part, to admit air to enter into the interior of the tube *b*; and to the cup *p*, is soldered a short tin neck or tube 3, that fits into the upper part of the column, in which a chamber *q*, is formed, to receive any waste oil or other dirt that may drop from the lamp in burning. A small stud *r*, is formed in the chamber *q*, which enters into a groove left in the neck *s*, to prevent the internal tube from being turned round, and make it a fixture with the column. There are small holes in the upper surface of the cup *p*, see figs. 20, and 21, to allow any oil which may overflow and trickle down outside the burner to drop into the waste cup *p*.

"I do not fix any precise dimensions for the parts of the above-described lamp; but I have found a lamp made with the parts of the proportions shown by the drawings, figs. 20, and 21, to burn very well with common oil, and with liquid cocoa-nut oil."

Fig. 24, represents another mode of constructing the improved lamp: the parts of the burner and the chimney are precisely the same as in fig. 20, but the reservoir is somewhat different; viz. instead of being composed of two distinct parts, a reservoir and a tray open to the atmosphere, it is one broad, hollow, flat vessel, made in two halves, the upper one being soldered tight all round the lower one. A small tube *n*, projects downwards from the upper part of the reservoir into one of the pipes c, c, which is soldered into the lower part of the reservoir, see fig. 24, the tube *n*, being of such length, that its lower end or mouth shall be at the level that the oil is intended to rise up to in the burner. This tube *n*, is soldered to the upper part of the reservoir, and is open at its upper end to the atmosphere, see fig. 24. To fill this reservoir with oil for charging the lamp, it must be removed with the burner from the column; the internal tube *h*, is then to be taken out of its place, and the reservoir turned upside down and placed over a tin tray D, in the position fig. 25, viz. with the top end of the tube *a*, placed in a tin tube 2, which is fitted into another tube 3, rising up from the bottom of the tray D. If any oil be still in the pipes c, or the burner, it will drop into the tube 2. Care must be taken to place the reservoir, with the pipe *n*, over the tray D; and then the curved spout of a funnel 4, being placed in the branch pipe C, at the opposite side of the reservoir to the pipe *n*, and oil poured through it, the air that is contained in the reservoir will escape out through the pipe *n*, as fast as oil is poured into the reservoir, until the same is full, which will be indicated by oil beginning to flow out at the aperture of the pipe *n*, into the tray D; any oil which so flows out from the reservoir being over filled, will drop into the tray D. As soon as the reservoir is properly filled, the internal tube of the burner must be put into its place, with the conical plug fitting accurately into its conical seat, and the reservoir being then lifted up and turned round into its proper position, and placed in the column, as in fig. 24, the oil will flow down from the reservoir through the pipes C, into the burner, and keep the same filled up to the level of the lower end of the pipe *n*, as long as any oil remains in the reservoir, on the principle of a fountain lamp as already described for the lamp shown in fig. 20.

Fig. 26, represents one of the improved lamps adapted to be hung against a wall as a hall or staircase lamp. In this, as the body of the lamp to which the branch pipe C, is attached cannot be turned round, the internal tube *b*, is adapted to be turned round instead. For that purpose, the conical plug is the reverse of what it is in the lamps, before described, as will be seen by the drawing; viz. the large part of the cone is at the upper end, and it drops into a conical seat formed to receive it in the lower end of the external tube *a*: the lower end of the internal tube projects a little below the external tube, and enters into a cup *p*, intended to receive the waste oil, and a cross pin is put through the cup, and the end of the tube *b*, to fasten the cup thereto, and to answer at the same time the purpose of preventing the conical plug from being drawn up by any accident out of its seat. The wick is borne as in the lamps before described, by a small tube which fits over the internal tube *b*, a pin on the internal surface of the wick tube entering into a spiral groove *m*, in the internal tube, while another pin on its external surface enters into a vertical groove in the external tube *a*. Hence to raise or lower the wick, the cup *p*, must be laid hold of and turned round, and that will cause the internal tube to turn round in its conical fitting, and raise or lower the wick by means of the spiral groove, and also the vertical groove: B, is the oil reservoir, which is a long cylinder closed at the top and open at the bottom, fitting loosely into the outer tube A, which communicates by the branch pipe C, to the burner. In the internal tube or reservoir B, a plug or valve *u*, is placed, which when the reservoir B, is in its place in the tube A, (viz. placed vertically therein, with the margin of its top resting on the upper end of tube A,) is raised up so as to leave the aperture uncovered, by means of a small rod or stem *v*, projecting out from the underside of the valve *u*, which rod comes in contact with the bottom of the tube A, (see the figure,) and then the oil contained in the reservoir can flow out therefrom through the pipe C, into the burner. To fill the reservoir, it is to be drawn out and inverted, and oil poured in at the aperture *i*, until it is nearly full. The valve *u*, should then be drawn by its stem *v*, into close contact with the bottom of the reservoir, so as to close the aperture *i*; and the reservoir being then turned round upright, can be put into its place in the tube A, without letting the oil escape, the weight of the oil keeping the valve *u*, shut; but as soon as the stem *v*, comes in contact with the bottom of tube A, the valve *u*, is lifted up, and allows oil to flow, as aforesaid, into the burner. The valve *u*, is kept open as long as the reservoir B, is in its place in the tube A; the mouth of the aperture *i*, is at the level that the oil is intended to rise to in the burner, and the oil will pass from the reservoir through the pipe C, and remain at that level in the burner during the burning of the lamp, as long as there is any oil in the reservoir, on the same principle as in the lamps known as common fountain lamps, because any oil that is consumed by the combustion, is drawn away from the lower part of the tube A, whereby the mouth of the aperture *i*, becomes for an instant uncovered, enough to let in as much atmospheric air as will replace that quantity of oil; the air will thus get into the reservoir B, and press on the surface of the oil so as to allow an equivalent quantity thereof to flow out into the burner, to that which has been drawn off by the combustion, whereby the oil will be constantly maintained in the burner to the level of the mouth of the aperture *i*. The other parts of this lamp are sufficiently obvious by inspection of the drawing, and sufficiently similar to those of the lamps already described, to need no description. For a suspended lamp with several burners, a similar arrangement of the parts of the burners to that described in reference to fig. 26, will be adopted; viz. the internal tube must be turned round, while the external ones remain stationary. I have not given any drawing of a suspended lamp on the plan of the improved lamp, as the mode of constructing it will be obvious to any lamp maker, after perusing the foregoing description.

Fig. 27, represents another mode of making an oil light, fitting between the external and internal tubes of the burner, by means of a screw stuffing-box, and a ring or collar of packing. Instead of the lower end of the internal tube *b*, being a conical plug, it is made cylindrical, and turned accurately. The external tube is made of the proper size around that part where the wick is placed, to leave an annular space for the oil, and a cylindrical box 2, is formed at the lower end of it, with an internal ledge or ring at 3; below the ledge 3, an annular space is left all around the internal tube *b*, into which a collar of packing 4, is inserted, the packing being interposed between the shoulder of the internal tube and the ledge 3, as well as surrounding the said internal tube. A female screw is cut in the mouth of the stuffing-box 2, and a screw 5, that fits accurately over the lower cylindrical end of the internal tube *b*, is screwed into the stuffing-box 2, by branches or handles 6, the end of the screw bearing on the packing 4, and forcing it hard in contact with the ring 3, and also against the surface of the cylindrical tube *b*, by which means the fitting is rendered sufficiently tight for oil to stand in the burner, as shown in the drawing. But at the same time, the upper part of the lamp, viz. the reservoir, external tube *a*, and screw 5, can be turned round upon the internal tube *b*, which is fixed into the column in the way described in reference to the lamps figs. 20, and 24. The reservoir of this lamp may be either like the reservoir in the drawing, fig. 20, or like that shown in fig. 24. I prefer the former for a lamp made thus, because it is better that the packing should not be disturbed, except when it is necessary to take out the internal tube to clean the same, or to renew the packing. But when the reservoir is made as in fig. 24, then, to fill it, the upper part of the lamp must be taken off the column, the screw 5, turned back till it quits the screw socket 2, and the internal tube *b*, drawn out of the burner. The reservoir will then be placed over the tray D, fig. 25, and fitted as described heretofore for the lamp, fig. 24. The internal tube must then be put back in its place, keeping the reservoir still inverted as it was while being filled, and the screw 5, must be screwed round to press upon the packing, until when the reservoir is turned round and placed upright in its proper position, as shown in fig. 24, viz. as it would stand in the column: no oil leaks by the joint at 7, or round the screw 5, if hemp packing is used, it will, when first put in, become saturated and softened by the oil, and allow leakage at the joint 7. The screw must then be screwed in more, so as to compress the packing a little more, and so on from time to time for a few days, by which time the packing will become hard and impervious to oil, and make a sound fitting between the external and internal tubes of the burner. For general use, I prefer the method described hereinbefore, in reference to figs. 20, and 24, viz. with a conical plug on the internal tube, because this last plan, as described in reference to fig. 27, requires more perfect workmanship, and more care in management than the former: but I have found a lamp on this plan, with the parts of the proportions shown by the drawing, fig. 27, to burn well with a collar of packing made of hemp and tow mixed; and I have also found a double ring or collar of such leather as is used for the cup leathers of pump buckets to answer, one being interposed between the shoulder of the internal tube and the ledge 3, fitting tightly over the small part of the internal tube, and the other fitting over the enlarged cylindrical part of the internal tube. The margin of the screw 5, and the brass cup 8, are pierced with a couple of holes, to allow any waste oil to drop down into the waste chamber. In all the lamps hereinbefore described, the length of the short tubes *n*, *n*, figs. 20, and 24, or of the tube B, in fig. 26, through which the oil flows from the reservoir into the branch pipe C, should be such that a horizontal line drawn from the lower end thereof through the burner will be somewhat below the top thereof, so as to keep the oil constantly up to a level about a quarter of an inch, or a little more, below the top of the burner. The tops of the internal and external tubes being exactly at the same height as shown in all the drawings. For if the level of the oil be kept too high in the burner, it will be apt to overflow a little when the lamp is moved, or the cotton wick suddenly raised or lowered.

"Having now described several varieties of *the improved lamp,* for which a patent has been granted to me as aforesaid, so as to enable a competent workman to make the same, I do hereby declare, that I do not claim any of the parts thereof separately, as the same when taken separately and singly are known, and may have been used for lamps or other purposes; but I claim only the combination of the several parts, with the method which I have particularly described, and which has not been heretofore used for lamps, *of making the external and internal tubes of the burner in two independent pieces, one of which can be turned round upon the other.*"—[*Inrolled in the Inrolment Office, August,* 1832.]

To GEORGE MINTER, *of Princes-street, Soho, in the county of Middlesex, cabinet maker and upholsterer, for his having invented a fastening for dining tables and other purposes.*—[Sealed 9th November, 1831.]

THE object of this invention is to render the fastenings of dining and other tables more simple and secure, than those now in common use; the manner in which this is effected will be readily understood, by reference to the figure drawings. Plate XII., fig. 14, represents part of two leaves of a table connected together by the improved fastening; fig. 15, represents the two leaves apart; fig. 16, represents the edge view of the fastening, detached from the table; and fig. 17, is the tongue or bolt, which holds the two fastenings together, as seen in fig. 14.

The improved fastenings consist of two parts *a*, and *b*; the part *a*, has two hooks or staples, and the other part *b*, only one: these, when brought together previous to clamping with the tongue *c*, form a series of eyes, and as the tongue is slightly wedge-shaped when inserted, it gradually draws the leaves of the table close together, and holds them securely.

This fastening may be applied to temporary platforms, and also to scaffolding, and the Patentee states, "that for dining tables and the finer sort of work, he generally makes the fastenings of brass, but for temporary platforms and such sort of rough work he generally uses iron, as that is a cheaper metal."

The Patentee states, in conclusion, "that he does not intend to claim any of the parts separately, but he does claim as his invention the application of an apparatus, similar to that above exhibited to the purposes above described."—[*Inrolled in the Inrolment Office, May,* 1832.]

To JOHN MASTERS, *of Leicester, in the county of Leicester, for his invention of an improved essence of anchovies.*—[Sealed 14th March, 1836.]

IT appears that the object of this invention is to obtain an essence of anchovies, that is, transparent or nearly so, instead of the thick and opaque essence, which is now in ordinary use. The manner of making the common essence is to mix flour or other materials for thickening and colouring, by which means an opaque and coloured essence is obtained. The manner in which the Patentee makes his transparent essence is as follows:—Take any given quantity of anchovies in the state in which they are imported, and add to them an equal quantity by weight of water, and place the whole in a suitable kettle or boiler, which is to be placed over a slow fire, and the contents are to be kept constantly stirred for two or three hours; the mixture is then to be taken off the fire, and when it becomes cold it is to be put into a strong canvas bag, and the essence is expressed through the interstices of the bag by means of pressure, administered in any convenient manner; the essence thus obtained is to be again filtered through flannel bags and filtering paper. It will now be perceived that as no flour is used for thickening, and care is observed in filtering the essence, as above described, the essence produced is transparent.

The Patentee here observes, "that if it is desired to render the essence thicker, it is necessary to take care that the material used for this purpose should be transparent, or nearly so."

In conclusion, the Patentee states, that "having now described his invention, and the manner of making or preparing the same, he wishes it to be understood that he does not confine himself to the precise means of producing the same, though the process which he has described is the best with which he is acquainted for the purpose: but what he claims as his invention, is, the manufacture of a transparent, or nearly transparent, essence of anchovies as above described."—[*Inrolled in the Inrolment Office, September* 1836.]

To Daniel Rutter Long, *of Bath, in the county of Somerset, chemist, for his invention of a new mode of applying certain anti-putrescent and flavouring substances to meat.*—[Sealed 13th November, 1834.]

This invention consists in injecting into the blood-vessels of animals an anti-putrescent liquid, for the purpose of preserving their flesh wholesome for some length of time, and also for flavouring it instantaneously. The manner in which this is carried into effect is as follows:—First, kill the animal by knocking it on the head, or cutting its throat, according to the animal to be operated upon, then, if the heart is not torn or cut, make an incision in it, so that the animal may bleed freely: the wound or incision in the heart should be made about an inch to the left of the breast bone, and between the sixth and seventh ribs. This wound will, perhaps, not be found to bleed freely, as the blood which flows from the incision in the heart, will most of it be found in the chest: the animal must then be laid upon its back on a bench, and the chest must be opened; great care being taken that none of the larger blood-vessels are injured, because if such is the case, the operation will become much more tedious and troublesome. The greatest danger, if any, is about the throat; but if the knife is kept close to the breast bone, none of the vessels will be injured. When the chest is opened, it must be kept so by a stick; and upon examination a wound will be found in the left ventricle of the heart, which is the incision made for bleeding the animal. If this incision will answer the purpose, the anti-putrescent liquid may be injected at once by a force-pump; if not, another incision must be made towards the lower end of the heart, and the heart should be lifted up, and turned a little to the left side: then a mouth tube connected to a flexible pipe must be inserted into the heart for about three inches, and the flesh closed up all round it. Incisions should be made in the feet and nose of the animal, and the tail should be cut off, when the liquor will be found at these extremities to ooze out as it is forced through the blood-vessels by the pump. A man must then gently and steadily pump the anti-putrescent liquid through the pipe, and it will run all through the entire animal, impregnating the flesh throughout. This must be continued until such time as the blood-vessels of the animal are quite full, which will be known by its running out at the heart. If any of the larger vessels are injured, or the part considerably torn, the anti-putrescent liquid must be injected at two or three different parts of the body, such as the neck, &c.; the mouth-tube in these instances being of smaller diameter. It is here stated, that it is not necessary to inject the fluid into the upper part of the body of small animals, even if the blood-vessels are torn or cut, as it would cause a great deal of trouble, and be very tedious, and perhaps would not repay the time expended upon it, but it will be found quite sufficient to inject the anti-putrescent liquid at the lower parts of the body.

The Patentee here observes, that the before-mentioned operation must be made immediately that it is killed, and before it has time to cool; and also that the carcase should be hung up entire, for some hours, or perhaps till the next day, if it is not required to be consumed immediately, because if the animal is cut up directly after the operation, the anti-putrescent liquid will drain out of the vessels before it has had time to impregnate the flesh, and thus the object of the operation would be frustrated.

The Patentee then describes the manner in which he makes the anti-putrescent liquid, and which he divides into three sorts, viz.:—

No. 1. Four gallons of water, eighteen pounds of common salt, and sixteen pounds of saltpetre: this is calculated to preserve the meat wholesome, without any other dressing or preparing, and the meat when cold may be packed up with layers of common salt. This solution should be kept on the fire till all the salt is dissolved; a small quantity should then be taken out of the vessel, and allowed to remain till it has cooled down to that degree of temperature, in which a person may bear his hand; it may then be injected, as before described: that liquid which is remaining on the fire being kept hot for the purpose of replenishing the vessels, from which the pump is injecting, and also for keeping the liquid at the required temperature. If it is desired in preserving bacon to give it the smoky flavour, a small quantity of Westphalian liquid may be added: if any other flavour may be thought desirable in finer meats, it may be obtained by the addition of spices or other suitable materials.

No. 2. Four imperial gallons of water to sixteen pounds of common salt. This mixture must be administered cold, and is calculated to preserve the meat at least six weeks. The meat when dressed in this manner may be kept by being packed in layers of salt, and previous to dressing it should be washed.

No. 3. Two imperial gallons of water to four pounds of common salt. This mixture is calculated to keep the meat free from putrefaction for above three weeks, and is used mostly for joints that are required to hang for some time: a little vinegar or spices may be added to this solution, and will be found to give a very pleasant flavour to the articles thus operated upon.—[*Inrolled in the Inrolment Office, May,* 1835.]

THE REWARDS ADJUDGED BY THE SOCIETY OF ARTS DURING THE PRESENT SESSION.

IN MECHANICS AND OTHER PRACTICAL ARTS.

To Mr. James Ryan, 59, Hare-street. Bethnal-green, for his instrument for drying silk in the loom, the silver Isis medal and 5*l.*

— Mr. William Webb, 26, Wood-street, Spitalfields, and Mr. George East, 5, Turner's-square, Hoxton New Town, for their improved jacquard machine for weaving figured velvet, two silver Isis medals.

— Mr. Henry Chapman, of the Royal Dock-yard, Woolwich, for his improved cross-tree for ships of war, the silver medal.

— Mr. J. Bowen, Corkbeg-Cloyne, for his dredging machine, 5*l.*

— Mr. James Marsh, of the Royal Arsenal, Woolwich, for his percussion tubes for ship's cannon, the silver medal.

— Mr. J. Kingston, of the Royal Dock-yard, Woolwich, for his blow-off pipe marine steam-engines, the silver medal.

— Mr. Isaac Dodds, Masbro', near Rotherham, for his safe-plug for a steam boiler, the silver medal.

— the same, for his cast-iron wheel for locomotive carriages, the silver medal.

— Mr. G. A. Patterson, 21, Coppice-row, Clerkenwell, for his repeating motion for a quarter clock, the silver medal and 10*l.*

— the same, for his vertical escapement for pocket watches, 5*l.*

— Mr. H. Mapple, 69, Red Lion-street, Clerkenwell, for his escapement for time-pieces, 5*l.*

— Mr. T. Cole, 23, Upper King-street, Bloomsbury, for his clock escapement and self-adjusting pendulum, the silver medal.

— Messrs. C. and J. Mac Dowal, 21, Church-street, Kensington, for their centripetal dial-plate for clocks, the silver Isis medal.

— W. Talbot Agar, Esq., Elm Lodge, Camden Town, for his instrument for turning over the leaves of a music book, the silver Isis medal.

— Edward Mammatt, Esq., Ashby-de-la-Zouch, for his writing apparatus for the use of the blind, the silver medal.

To Mr. W. Juggins, 22, James-street, Covent Garden, for his scale-weights of porcelain, the silver Isis medal.

— Mr. James Sperring, Duke-street, Bloomsbury, for his method of enclosing sliding doors, the silver Isis medal.

— Mr. Charles Arundel, 8, Great Mitchel-street, St. Luke's, for his improved router, the silver Isis medal.

— Mr. Andrew Ross, 15, St. John's-square, for his adjusting object glass for a compound acromatic microscope, the gold Isis medal.

— Mr. T. Slacks, Langholm, for his method of building an obelisk without scaffolding, the gold Isis medal.

— Mr. Richard Jones, 75, Leaman-street, for his improvement in the apparatus for raising and lowering the diving bell, the silver medal.

THE THANKS OF THE SOCIETY HAVE BEEN VOTED TO

Captain Jenkins, the British Resident in Assam, for samples of cloth manufactured from the Area silk and the Moongha silk by the inhabitants of Lower Assam.

Commander J. Rorie, Plymouth, for a life boat.

T. Tassell Grant, Esq., Clarence Yard, Gosport, for his life buoy.

C. Daubeny, M.D., professor of chemistry in the University of Oxford, for his apparatus for taking a specimen of water from any depth.

Thomas Wicksteed, Esq., East London Water-works, Old Ford, for his experiments on the application of wooden wedges to secure the joints of water-pipes.

IN THE FINE ARTS.—ORIGINALS.

To Mr. T. Clark, 3, William-street, Pentonville, for a painting in oil of a view in Normandy, the gold Isis medal.

— Mr. H. Sidney Melville, 34, Mornington-crescent, for a composition in oil of figures and landscape, the silver medal.

— Mr. F. Goodall, Mornington Grove Cottage, for a drawing in water colours of the gateway of Lambeth Palace, the silver Isis medal.

— Mr. E. Goodall, Mornington Grove Cottage, for a drawing in water colours of the landin of the Lord Mayor at Blackfriars Bridge, the silver medal.

To Mr. T. Hollis, 4, Gloster-buildings, Walworth, for an historical drawing in water colours, the gold Isis medal.

— Mr. Marshall Claxton, 7, Newman-street, for a portrait in oil, the gold Isis medal.

— Mr. William Waterhouse, 39, Charterhouse-square, for a portrait in oil, the silver medal.

— Mr. S. Taylor, 64, Westbourne-terrace, Bayswater, for a portrait in water-colours, the silver medal.

— Mr. W. Joseph Rivers, 11, Church-street, Islington, for a painting in oil of a horse's head, the silver medal.

— Miss Sophia Sass, 6, Charlotte-street, Bloomsbury, for a drawing in chalk from a bust, the silver medal.

— Mr. Hugh Davies, 8, Smith-street, Chelsea, for a drawing in chalk from a bust, the silver Isis medal.

— Mr. James Clark Hook, Dalston, for a drawing in chalk from a bust, the silver medal.

— Mr. W. P. Frith, 6, Charlotte-street, Bloomsbury, for a finished drawing from a cast, the silver medal.

— Mr. Joseph Edward Fisher, 36, Leadenhall-street, for an outline drawing from a cast, the silver Isis medal.

— Miss Augusta Eliza Cole, 57, Upper Norton-street, Portland-place, for a portrait in miniature, the gold Isis medal.

— Mr. Charles Forster, jun., 7, Highworth-street, Lisson-grove, for a portrait in miniature, the silver medal.

— Mr. Benjamin B. Wadham, 27, St. David-street, New Kent-road, for a portrait in miniature, the silver Isis medal.

— Mr. Joseph Charles Day, 61, Poland-street, for a medallic portrait, the silver Isis medal.

— Mr. T. Pinches, 5, Porter-street, Soho, for a medal die of a figure, the silver medal.

— Mr. George Weatherhead, 43, Old Compton-street, for an intaglio in cornelian of a horse, the silver Isis medal.

— Miss Ellen Cole, 57, Upper Norton-street, Portland-place, for a lithograph in pen and ink, the silver medal.

— Mr. Richard Smith, 13, Dean-street, Westminster, for an engraving of figures, the silver medal.

To Mr. Edward Patten, 20, Aldenham-terrace, Somers Town, for an engraving of a church, the silver medal.

— Miss Mary Ann Nichols, 6, Upper Thames-street, for a drawing in water-colours of flowers from nature, the silver medal.

— Mr. E. B. Stephens, 78, Charlotte-street, Fitzroy-square, for a model of a figure, the silver medal.

— Mr. Charles Branwhite, Bristol, for a figure in bas-relief, the silver medal.

— Mr. Joseph Pitts, 5, Watkins-terrace, Pimlico, for a group of figures, in bas-relief, the silver medal.

— Mr. C. Turner, 13, Turnham-place, Curtain-road, for a carving in wood of flowers, the silver medal.

— Mr. Ed. Baillie, 7, Henry-street, Cumberland-market, for an enamel on glass of figures, the silver medal.

— Mr. Robert W. Billings, Manor House, Kentish Town, for an outline etching of Windsor Castle, the gold Isis medal.

— Mr. J. Henry Steinmetz, Upper Homerton, for a design for a country mansion, the silver medal.

— Mr. James Bell, West Hill, Wandsworth, for a design for a country mansion, the silver medal.

— Mr. J. Taylor, jun., 22, Parliament-street, for a design for a gothic altar-piece, the silver medal.

— Mr. James Caporn, 250, Blackfriars-road, for a set of drawings of West Thurrock Church, the silver medal.

— Mr. Eugenius Birch, Red Lyon-place, Giltspur-street, for drawings of a marine steam-engine, the silver Isis medal.

List of Patents

Granted in Scotland between 22nd *May and* 22nd *June,* 1837.

To Charles Guynemer, of Manchester-street, Manchester-square, in the county of Middlesex, professor of singing, for an invention of certain improvements in piano-fortes, communicated to him by a foreigner residing abroad.—24th May.

— William Bridges Adams, of Porchester-terrace, Bayswater, in the county of Middlesex, coach-maker, for an invention of certain improvements in the construction of wheels, and in wheel-carriages.—2nd June.

To William Gossage, of Stoke Prior, in the county of Worcester, chemist, for an invention of certain improved apparatus for decomposing common salt, and for condensing and making use of the gaseous product of such decomposition ; also certain improvements in the mode of conducting these processes.—2nd June.

— John Joseph Charles Sheridan, of Ironmonger-lane, in the city of London, in the county of Middlesex, chemist, for an invention of certain improvements in the several processes of saccharine, vinous, and acetous fermentation.—6th June.

— Pierre Bartlemey Guinebert Debac, of Brixton, in the county of Surrey, civil engineer, for an invention of improvements applicable to rail-roads.—12th June.

— Joel Livsey, of Bury, in the county of Lancaster, cotton spinner, for an invention of certain improvements in machinery used for spinning, preparing, and doubling cotton and other fibrous substances.—21st June.

New Patents
SEALED IN ENGLAND,
June, 1837.

To James Partridge Blake, of No. 31, Little Queen-street, in the parish of St. Giles-in-the-Fields, and county of Middlesex, engineer, for certain improvements in machinery or apparatus for hulling, cleansing, preparing, or dressing paddy or rough rice; hulling, dressing, and preparing oats and such other grain, part or parts of which are applicable to other purposes, being a communication from a foreigner residing abroad.—Sealed 30th May—6 months for inrolment.

To Joseph Woollams, of Wells, in the county of

Somerset, gentleman, for his invention of certain improved means of obtaining power and motion from known sources.—Sealed 30th May—6 months for inrolment.

To Francis William Gerish, of East-road, City-road, in the county of Middlesex, smith and ironmonger, for his invention of improvements in the apparatus for closing doors, gates, and shutters.—Sealed 30th May—6 months for inrolment.

To Richard Oke Millett, of Penpalls Hayle, in the county of Cornwall, gentleman, for his invention of improvements in instruments for extracting teeth.—Sealed 1st June—6 months for inrolment.

In pursuance of the report of the judicial committee of his Majesty's privy council to Edward Schmidt Swaine, formerly of Bucklersbury, in the city of London, but now of Leeds, in the county of York, his executors, administrators, and assigns, for his invention of a method of producing and preserving artificial mineral waters, and for machinery to effect the same, to hold the same within England, Wales, the town of Berwick-upon-Tweed, and also in all his Majesty's colonies and plantations abroad, for the term of seven years, to be computed from the 9th day of October, 1837, being the day of the expiration of the former Letters Patent, granted to him for the term of fourteen years for the said invention.—Sealed 6th June.

To Joseph Clisild Daniell, of Limpley Stoke, in the county of Wilts, gentleman, for his invention of certain improvements applicable to stone masonry.—Sealed 6th June—6 months for inrolment.

To Miles Berry, of the Office for Patents, Chancery-lane, in the parish of St. Andrew, Holborn, and county of Middlesex, mechanical draftsman and patent-agent, for a certain improvement or certain improvements in obtaining motive power for propelling or working machinery, being a communication from a foreigner residing abroad.—Sealed 6th June—6 monthsfor inrolment.

To John Kirkham, of Aldenham-terrace, St. Pancras-road, in the county of Middlesex, engineer, for his invention of an improved mode of removing the carbonaceous incrustation from the internal surfaces of retorts, employed in the process of distilling coal for generating gas—Sealed 8th June—6 months for inrolment.

To John George Bodmer, of Bolton-le-Moors, in the county of Lancaster, civil-engineer, for his invention of certain improvements in machinery for spinning and doubling cotton, wool, silk, flax, and other fibrous materials.—Sealed 12th June—6 months for inrolment.

To Godfrey Woone, of Berkeley-street, Piccadilly, in the county of Middlesex, gentleman, for his invention of an improved method of forming plates with raised surfaces thereon for printing impressions on different substances.—Sealed 12th June—6 months for inrolment.

To William Fothergill Cooke, of Breeds-place, Hastings, in the county of Sussex, esq., and Charles Wheatstone, of Conduit-street, Hanover-square, in the county of Middlesex, esq., for their invention of improvements in giving signals and sounding alarms at distant places, by means of electric currents, transmitted through metallic circuits.—Sealed 12th June—6 months for inrolment.

To Richard Roe, of Everton, near Bawtry, in the county of York, gentleman, for his invention of a certain improvement or certain improvements in machinery or apparatus for making bricks, tiles, and other articles made from earthy materials.—Sealed 17th June—6 months for inrolment.

To James Leonard Clement Thomas, of Covent-garden, in the county of Middlesex, esq., for an improvement applicable to steam-engines and steam-generators, having for its object economy of fuel, being a communication from a foreigner residing abroad.—Sealed 17th June—6 months for inrolment.

To William Nicholson, of Manchester, in the county of Lancaster, engineer, for certain improvements in the construction and arrangement of preparation and spinning machinery, being a communication.—Sealed 17th June—6 months for inrolment.

To James Buckingham, of Great Randolph-street, Camden Town, in the county of Middlesex, civil engineer, for his invention of certain improved combinations of machinery to be applied as mechanical agents in a great variety of situations in which toothed gear, and other mechanism, have been heretofore employed.—Sealed 17th June—6 months for inrolment,

To Theophilus John Nash, of John-street, Downshire Hill, in the parish of Hampstead, in the county of Middlesex, letter-maker, and John Ross, of Wild-street, Lincoln's Inn-fields, in the said county, brass-worker, for their invention of a method of manufacturing in metals, wood, and other substances and materials, letters, figures, and other devices, having a flat surface, presenting, by the aid of colours, the appearance of projection; and domed letters, figures, and other devices made from the same materials, without seam or joint.—Sealed 19th June—2 months for inrolment.

To William Yetts, of Yarmouth, in the county of Norfolk, merchant, for his invention of an improved mode of caulking ships and other vessels.—Sealed 19th June—2 months for inrolment.

CELESTIAL PHENOMENA, for July, 1837.

D.	H.	M.	
1			Clock before the ☉ 3m. 23s.
	—		☽ rises 1h. 59m. M.
	—		☽ passes mer. 10h. 52m. M.
	—		☽ sets 7h. 53m. A.
	15		♀ in Perihelion.
	20		☉ in Apogee.
2	9	30	Ecliptic conj. or ● new moon.
3	11	25	♀ in conj. with the ☽ diff. of dec. 3. 50. S.
5			Clock before the ☉ 4m. 8s.
	—		☽ rises 5h. 53m. M.
	—		☽ passes mer. 2h. 14m. A.
	—		☽ sets 10h. 18m. A.
	11	47	♃ in conj. with the ☽ diff. of dec. 4. 7. S.
8	3	48	♂ in conj. with the ☽ diff. of dec. 2. 42. S.
10			Clock before the ☉ 4m. 56s.
	—		☽ rises 11h. 51m. M.
	—		☽ passes mer. 5h. 42m. A.
	—		☽ sets 11h. 18m. A.
11	1	10	☽ in □ or first quarter.
12	8	28	♄ in conj. with the ☽ diff. of dec. 3. 46. N.
14			Mer. R. A. 6h. 27m. dec. 23. 2. N.
	—		Ven. R. A. 8h. 40m. dec. 19. 51. N.
	—		Mars R. A. 11h. 38m. dec. 3. 1. N.
	—		Vesta R. A. 23h. 30m. dec. 11. 0. S.
	—		Juno R. A. 13h. 26m. dec. 1. 36. N.
	—		Pallas R. A. 1h. 55m. dec. 1. 30. N.
	—		Ceres R. A. 4h. 4m. dec. 15. 34. N.
14			Jupiter R. A. 9h. 33m. dec. 15. 25. N.
	—		Saturn R. A. 14h. 35m. dec. 12. 44. S.
	—		Georg. R. A. 22h. 40m. dec. 9. 16. S.
	—		☿ passes mer. 23h. 3m.
	—		♀ passes mer. 1h. 12m.
	—		♂ passes mer. 4h. 9m.
	—		♃ passes mer. 2h. 4m.
	22	28	♄ stationary.
15			Clock before the ☉ 5m. 33s.
	—		☽ rises 6h. 58m. A.
	—		☽ passes mer. 10h. 1m. A.
	—		☽ sets 0h. 35m. M.
	9	13	☿ in the ascending node.
17	10	51	Ecliptic opp. or ○ full moon.
19	22	41	☿ in Perihelion.
20			Clock before the ☉ 5m. 57s.
	—		☽ rises 9h. 59m. A.
	—		☽ passes mer. 2h. 15m. M.
	—		☽ sets 7h. 3m. M.
	4	8	♅ in conj. with the ☽ diff. of dec. 3. 18. N.
21			Occul. p Piscium, im. 12h. 20m.
	—		Occul. 9 Piscium, im. 14h. 19m.
23	15	26	♀ greatest Hel. Lat. N.
24	2	7	☽ in □ or last quarter.
25			Clock before the ☉ 6m. 8s.
	—		☽ rises 11h. 9m. A.
	—		☽ passes mer. 6h. 19m. M.
	—		☽ sets 2h. 4m. A.
26	21	28	♀ in conj. with ♃ diff. of dec. 0. 44. N.
28	6	23	☿ in sup. conj. with the ☉
30	6	47	☿ greatest Hel. Lat. N.

The Satellites of Jupiter are not visible this month, Jupiter being too near to the Sun.

J. LEWTHWAITE, Rotherhithe.

METEOROLOGICAL JOURNAL,

FOR MAY AND JUNE, 1837.

1837.	Thermo.		Barometer.		Rain in inches.	1837.	Thermo.		Barometer.		Rain in inches.
	Hig.	Low.	High.	Low.			Hig.	Low.	High.	Low.	
May						June					
26	66	38	29,80	Staty.		10	67	46	29,61	29,57	,15
27	69	28	29,95	29,88		11	68	46	29,77	29,68	
28	61	32	29,98	29,94		12	63	41	29,84	29,81	,125
29	68	45	29,95	29,93	,025	13	74	50	29,77	Staty.	,05
30	65	38	30,00	29,98		14	73	51	29,80	29,72	,3
31	67	34	29,99	29,92		15	75	39	29,90	29,88	
June						16	76	43	29,89	29,88	
1	63	42	29,89	29,85	,25	17	73	45	29,86	29,84	,0875
2	60	38	29,93	29,91	,25	18	65	46	29,77	29,73	,1125
3	63	39	29,90	Staty.		19	73	45	29,85	29,84	,1
4	66	28	30,01	Staty.	,025	20	75	40	29,86	29,85	
5	73	39	30,07	30,04		21	74	47	30,05	29,94	
6	69	41	30,07	30,02		22	75	39	30,21	30,18	
7	61	30	30,10	30,07		23	77	41	30,25	30,23	
8	59	30	29,89	29,83		24	80	39	30,17	30,08	
9	68	38	29,75	29,55		25	79	41	30,04	Staty.	

Edmonton. CHARLES HENRY ADAMS.

Latitude 51° 37 32 N.
Longitude 3 51 West of Greenwich.

ERRATUM.—Page 212, line 13, for Plate XIV. read Plate XII.

THE

London

JOURNAL AND REPERTORY

OF

Arts, Sciences, and Manufactures.

CONJOINED SERIES.

No. LXV.

Recent Patents.

To MILES BERRY, *of the Office for Patents*, 66, *Chancery-lane, in the county of Middlesex, civil-engineer and mechanical draftsman, for an improved apparatus for torrefying, baking, and roasting vegetable substances; which, with certain modifications and additions, is also applicable to the evaporation and concentration of saccharine juices and other liquids.*—[Sealed 13th June, 1836.]

THIS invention of improved apparatus for torrefying, baking, and roasting vegetable substances, which, with certain modifications and additions, is also applicable to the evaporation and concentration of juices and other liquids, is, in the first instance, more particularly applicable to the process of torrefying, baking, or roasting mealy or floury vegetable substances, such as wheat or potatoe starch, flour, or fecula; and is particularly applicable to the process of making or manufacturing an article of commerce commonly called "British gum," which is a mucilaginous matter used by calico printers as a substitute for foreign gums, for the purpose of thickening their colours, or as a vehicle for mixing and carrying them, and is formed of potatoe or wheat starch, or fecula, torrefied or roasted to the proper degree, according to the purpose for which it is required, and which improved apparatus is also applicable to the torrefying, roasting, or baking grain or seeds, whole or unground. And, further, this improved apparatus, by means of certain modifications and additions, is also applicable to the evaporation and concentration of syrups or juices, or saline solutions. I shall, therefore, proceed first, to describe the application of this improved apparatus to the process or operation of torrefying, baking, or roasting vegetable substances, such as starch, meal, flour, or fecula, for the purpose of making "British gum," and then describe the modifications and additions necessary for its application to the process of evaporating syrups or saline solutions.

The several figures in Plate XIII., are representations of the apparatus for the first part of its application.

Fig. 1, is a front elevation of the apparatus; fig. 2, is a plan or horizontal view; fig. 3, is an end view; and fig. 4, is a vertical section, taken in the direction of the dotted lines A, B, and C, D, in figs. 2, and 3, the same letters of reference being marked upon similar parts in all the figures: A, A, is the brickwork of the fire-place, which has two cylindrical retorts or torrefying chambers F, F, of a similar construction placed therein; B, is the door of the furnace; C, the inside of the furnace or the fire-place; D, fire-bars or grate; E, the ash-pit;

G, G, registers or dampers, placed edgeways in the brickwork and flues, and moving horizontally to direct, at pleasure, the heat from the fire under the one or the other of the torrefying chambers: H, *H, H, are the flues formed in the side and in the back of the furnace, the former conducting the heat under the ovens or torrefying vessels: *i*, (fig. 2,) is a damper or register, moving vertically to open or close, at pleasure, the aperture H, in the back of the furnace (see fig. 3); *k*, *l*, are other registers, also moving vertically to open or shut the passage of the smoke to the chimney; *m*, is the main or direct flue, constructed of iron or brickwork, and forming the chimney through which the smoke of the furnace escapes. This chimney is divided into two parts by a vertical partition *n*, fig. 2, in order to separate the smoke which rises on the opening of the register *k*, from the smoke ascending into the chimney through the register and damper *l*: *o*, *o*, fig. 4, are apertures or doors formed in the brickwork on each side of the furnace, and are closed air-tight, except when it is necessary to open them to inspect the interior of the furnace or the under part of the torrefying chambers.

Description of the cylindrical ovens or torrefying chambers:—The two chambers or ovens being of the same construction, it will be sufficient to describe one of them. The torrefying chamber is made of copper or other suitable metal, and is represented in detached views, figs. 5, and 6; the first of which is a vertical section taken longitudinally, and the other a transversal vertical section of the same. The chamber is about four feet long, made in two parts, placed over one another; the upper part *p*, is the cover, which may vary in size from one-fourth to one-eighth of the circumference of the chamber. The lower part is formed of two sheets of metal, the internal one *q*, and the external one *r*; there being an intermediate space or capacity *s*, of about one inch and a half between them, to receive oil, thereby forming a hot or fluid bath for the chamber. The cover and the body part of the chamber are united together at *t*, by means of flanges projecting from the cover and screw-bolts, to make the joints tight; by unscrewing the bolts, the cover may be removed, and the interior of the chamber exposed: *v*, *v*, *v*, are short rectangular metal tubes fastened to the cover *p*, and into these tubes are placed the hoppers *x*. The ends of the torrefying chambers are closed tight by bolts, rivets, or soldering, so as not to allow the oil contained in the space *s*, to get into the interior. On the front end of the chamber is secured, by screw bolts, a thick copper plate Y, fig. 1, which closes the aperture or doorway by which the substances are removed when torrefied. At the side of the plate Y, is placed a proof-cock *z*, which is to be opened to ascertain the state of the substances under operation: *a'*, fig. 1, is a metal plate, fixed on the end of the boiler, to strengthen it and receive the axis of the agitator, which will be described hereafter. The plate Y, is furnished with two wooden handles *b'*, *b'*, by which it can be removed when the screws are unfastened; or instead of constructing the doorway and the front end of the chamber in the manner just described, it may be thought preferable to suppress the plates *a'*, and Y, and the proof-cock *z*, and construct the parts in the manner represented in detached front view fig. 7, and in section at fig. 8, which I shall now describe: *q*, *r*, are the two plates of metal forming the double-bottomed boiler, with the space *c'*, between them, into which space is introduced, at the part where the door of the boiler is formed, two plates of metal D', E', of the same form as a third or external plate F'; one plate of metal D', is rivetted and braized to the internal face of the plate *q*, and the plate E', is rivetted and braized to the internal face of the plate *r*; the junction between the parts being made perfect by lead placed between them, and the whole screwed together, as will be described. The third external plate F', is fixed on the external face of the end of the boiler *r*, by screw bolts, which pass through the three plates, and keep the joints tight. The upper part of the plate F', is pierced with five holes *q'*, into which screw bolts are passed, firmly attaching the stuffing box to the plate or bearing shown in the detached front and side views figs. 9, and 10; this stuffing box has a central hole or bearing *k'*, corresponding to the hole *g* 2, in the plate F', through which is passed the axis of an internal agitator, hereafter described. The cap, forming the door of the chamber, is secured by four screw bolts passed into holes formed in the lower part of the plate F', the cap being shown detached in a side and front view at figs. 11, and 12; this door or cap has a groove *n'*, to receive the bolts *h* 2, when applied against the plate F'. The proof-cock *o* 2, in this instance, is placed in the centre of the door, which is also provided with wooden handles.

"I shall now return to the description of the former figures:—*l'*, *l'*, figs. 1, and 2, are strong iron bars, the ends of which rest on the brickwork of the furnace, their centre parts carrying bearings or plummer boxes *a* 2, *a* 2, to receive the ends of the axis of the agitator: *m'*, are thermometers placed in the oil contained in the space or capacity *s*, to indicate its temperature; and *n'* is a pipe also communicating with the space *s*; *o'*, is a funnel placed on the top of this pipe; and *p'*, is a curved pipe conducting oil from an adjoining room, for filling the capacity *s*, when required; Q', is a cock placed on the pipe *p'*, to open or close the passage of the oils.

"When it is desired to supply the bath of the torrefying chamber placed on the left side, another pipe, long enough to reach the funnel *o* 2, is used to conduct the oil thereto: *r'*, is a pipe communicating with the oil bath *s*, to allow the escape of the gas formed by the heated oil; and *s'*, is a pipe also communicating with the bath *s*, and serves to regulate the height of the oil therein, and to let off any excess which may be introduced; a pipe *t'*, connects the lower part of the bath *s*, with a recipient, situated in an adjoining room; this pipe is provided with a cock *u'*, through which the bath *s*, is emptied of its contents: *v'*, represents the wall which separates the room where the apparatus is placed, from the adjoining one; *x'*, is an iron tubular flue leading from the flue *y'*, under the chambers of the chimney *m*."

Description of the internal agitator:—This is a most essential part of the apparatus, and is represented in longitudinal and end views in the detached figs. 13, and 14; and, when placed inside the torrefying chamber, and put in a continuous rotary motion, its purport is to take up and continually agitate the starch, fecula, or other floury or mealy substances introduced in the oven to be torrefied. This agitator is composed of the following parts:—*a* 2, is an iron shaft or axle passing through the centre of the chamber, as before stated, and revolving in proper bearings placed on the bars *l'*, see figs. 1, and 2; upon this shaft is mounted the metal arms *b* 2, *b* 2; to the extremity of these arms are affixed, by screws or otherwise, four blades *c* 2, *c* 2, with bevel edges, as seen best in fig. 14, and they are notched or indented like the teeth of a saw their whole length, see fig. 13. The indented edges of these blades should be placed very nearly, if not quite, in contact with the sides and bottom of the chamber or retort against which the starch or other substance is torrefied; but when the blades successively arrive at the top part of the chamber, opposite the cover *p*, the oval form of the cover leaves a small distance between it and the blades of the agitator.

The blades, instead of being notched or indented, may be flat or of any other shape more appropriate to the substance operated upon; and, if necessary, the agitator may have a lateral as well as rotary motion, or the points of one blade placed opposite the spaces of the next. The agitator is put in motion by a band passed from any first mover to the pulley or rigger *d* 2, mounted on the end of its shaft. The agitator should revolve at the rate of about forty to fifty-five revolutions a minute.

Action and operations of the apparatus:—On commencement, supposing the torrefying chamber, situate on the right hand side of the apparatus, to be put into operation, the cock *q*', fig. 2, should first be opened, to admit oil into the funnel *o*', which passes from thence through the pipe *n*', into the capacity or space *s*: when the space of the bath is filled, and the oil arrives to the pipe *s*', the cock *q*', is to be closed. The fire being previously lighted, the right hand damper *g*, is to be opened by drawing it outwards, the smoke and heated vapour will pass by the flue H, and spread throughout the flue *y*', formed between the outside of the chamber and the brickwork, and heats the oil in the bath *s*. During the time the oil is being heated, the torrefying chamber should be charged with about 130lbs. starch, or other mealy or floury substance to be operated upon, which is introduced by the middle hopper X, the agitator is set in motion when the heat has reached from about 250 to 260 degrees Fahrenheit, which will be indicated by the thermometer *m*'. The greater part of the moisture contained in the substance introduced in the chamber, will be evaporated, which is much assisted by the action of the agitator, and then 130lbs. of the same substance is to be introduced; care being taken to introduce the latter quantity little by little during the space of about half an hour. When the 260lbs. of substance has been thus introduced into the chamber, the hoppers must be closed with a wirework lid or any other perforated covering, and the thermometer should be allowed to attain from 455 to about 473 degrees Fahrenheit. A short time, say about five or ten minutes, before the torrefaction is completed, the right hand damper *g*, must be shut, and, as soon as the torrefaction is completed, which the attendant will determine by repeatedly opening the proof-cock, in order to ascertain the state of the substance under operation. The cock *x'*, must then be opened, and as soon as the heated oil has been drawn out of the space or bath *s*, it should be filled again with cold oil, the agitator still continuing to revolve until the thermometer be lowered to about 302 to 329 degrees Fahrenheit; then the end door *x*, is to be removed, after the nuts, which fasten it to the chamber, have been unscrewed; the torrefied substance can then be taken out of the chamber through the opening. The torrefied substance, when extracted from the boiler, is to be placed in large wooden troughs, and there spread on the bottoms, which are formed of sheet copper or other metal; and after the substance has cooled, it is to be sifted and stored away in barrels marked with the degree and number of the torrefied substance.

Observations:—Firstly, each operation lasts from about two hours and a half to three hours and a half, according to the dryness or dampness of the substance operated upon; secondly, in case it should be wished to obtain a product deeply coloured, then the torrefying chamber is to be placed on the naked fire without the application of the oil bath. In this case, care must be taken to empty the chamber immediately the torrefaction is completed, and spread the substance in thin layers to preserve the required tinge; thirdly, instead of employing oil for the bath in the chamber *s*, any other material may be used which can be raised without danger to a degree of heat varying from 455 to 478 degrees Fahrenheit; fourthly, the torrefying chamber shown in the drawing is about four feet in length, but its dimensions may be varied without inconvenience; when this is done the quantity of substances to be introduced therein should vary in the same proportions; fifthly, as it will be requisite from time to time to remove the torrefying chamber, in order to clean its outside from the dirt which the oil and heat may have caused to adhere thereto, it should be so constructed that its outer diameter may be able to pass through the opening of the external casing or bath. The principal novel features of this apparatus, as applied to the torrefying, roasting, or baking vegetable substances, and which are, therefore, intended to be claimed under the above in part recited Letters Patent are, firstly, in the application to the torrefication of vegetable substances, either ground or in grain, of a torrefying chamber with a double bottom or outer casing, or bath, set in connexion with a furnace or fire-place, and its flues constructed so as to admit of intercepting the heat at will, by means of registers or dampers; the internal chamber, containing the substance to be torrefied, being provided with an agitator put in constant motion, while the outer casing or bath contains oil, oily substance, or other suitable compound, or mixture, or air, capable of taking up the heat proceeding from the furnace, and transferring it to the chamber or oven. It will, of course, be understood that the dimensions and proportions of the chamber and agitator may be varied according to the quantity and nature of the substance to be operated upon. Secondly, in the means taken to regulate the heat to which the substance is submitted, and to cool it and the chamber by letting off the heated oil or other medium from the bath, while the agitator continues to stir up the torrefied substances. Thirdly, in the method described of obtaining nearly the same product by means of a single-bottomed chamber, which may be heated by the naked fire, or by means of hot air passed from a hot air stove, so as to produce the same effect. In this case, the thermometer would be placed in contact with a copper tube in the furnace; and, in order the better to regulate the operation, a ventilator should be employed to cool the chamber as soon as the torrefication has been completed. I would further observe, that expedition must be used to empty the chamber, and spread the torrefied substances in thin layers to cool; and, finally, that the furnace may be placed either between two chambers, as represented in the drawings, or under one chamber, but in both cases provided with the necessary flues, with registers or dampers to regulate or intercept the heat at pleasure.

Whereas, I have stated, that with certain modifications and additions, the torrefying apparatus might be rendered applicable to the evaporation and concentration of syrups and saccharine juices or saline solutions, I shall proceed to explain such additions and modifications:—

Firstly, as regards the evaporation of syrups or saccharine juices, or saline solutions in vessels exposed to atmospheric pressure. The evaporation is effected by means of a cylindrical boiler, with a double bottom or bath filled with oil, and set in connexion with a furnace similar to that used for the torrefying apparatus. The bottom of the boiler may be fluted or corrugated, if it be desired, so as to multiply the heating surfaces, and accelerate the operation. The same observations are also applicable to the apparatus for evaporating in vacuo, which will be described hereafter. The dimensions and form of the boiler have been given in speaking of the torrefying chamber; the liquid solution which it contains is set in motion by an agitator enclosed in the boiler as in the torrefying apparatus.

Description of the figures representing the several parts of an evaporating boiler or vessel.

Fig. 15, is a front and elevation of the boiler or vessel, having flutings or corrugations made in the bottom as shown by dots at A, in fig. 15; B, is the outer casing or bath containing oil in the space *c*, as in the torrefying apparatus; *d*, is the discharge pipe, with a cock *d'*; E, is the top of the boiler, which is of a pyramidical form, in place of the hoppers *x*, in the torrefying apparatus; F, is a pipe provided with a cock, communicating with the interior of the boiler to draw off the evaporated liquid; *g*, *g*, are pipes communicating with the bath to draw off the oil; H, H, are pipes to let the air escape when the oil is introduced into the bath; *i*, is a thermometer, placed in the oil to indicate its temperature; J, stuffing boxes at both extremities of the boiler, through which the shaft of the agitator is passed; K, an iron bar fixed in the brickwork, carrying proper bearings to receive the axis of the agitator, which has pulleys L, on its end, (see fig. 21,) for giving it motion; M, is the front of the furnace; N, the door; O, the ash-pit. Fig. 21, is a plan of the boiler; the top part E, is fixed to the lower part at *p*, *p*, *p*, *p*. When it is desired to direct the steam or other vapours produced in the boiler towards a ventilating box, shown detached in figs. 22, and 23, in order to draw them off by the ventilator contained therein, the top of the part E, of the boiler must be closed by a plate bolted on the joint shown at Q, fig. 15,; from this plate extends a pipe R, communicating with the box; (fig. 22,) to which it is connected by a joint *s* 2. Fig. 22, is a front view of the ventilating box, and fig. 23, is a plan of the same; T is the box or case inclined towards the exit pipe, *s*, for liquid, and also to the top of the recipient *s* 3; *u*, is the ventilator placed in the box; the cover of this box can be removed when required, by unscrewing the joints at X: *s*, is a pipe attached by a joint *s* 4, and communicating with a recipient similar to the one represented at S, T, *s*, T, fig. 17. The recipient should be provided with a graduated tube to show the height of liquid in it: *s'*, fig. 22, is a tube fixed into the top of the box, having a worm on its upper end; the situation of the pipe should be about thirty-five feet above the evaporating boiler; the worm of this pipe *s'*, passes through a refrigerating vessel T', filled with water supplied by the pipe *u'*, the superabundant water escaping by the pipe *u* 2: R', are the fans or wings of the ventilator; Y, Y, bearings of its shaft; Z, pulley mounted thereon to give it motion. Fig. 24, is a side elevation of the furnace and the boiler; T, is a cook for emptying the latter; A 2, is a small cock placed on a pipe branching from the pipe of the cock T; B 2, cup to be screwed on to the end of the branch pipe.

Operation of this apparatus, without the addition of the ventilator:—The bath or space *c*, is first filled with oil up the orifice of the escape pipe *d*, the fire is then to be lighted; the proper quantity of liquid solution to be operated upon is then poured into the boiler; when this liquid has reached about 112 degrees Fahrenheit, which is easily seen by the thermometer *i*, of the oil, the agitator must be made to revolve, at the rate of about forty to fifty revolutions a minute, and continue so to work until the liquid is sufficiently concentrated. The passage of the heat to the boiler must then be shut off, by closing the register or damper *h'*, fig. 15; and the revolution of the agitator should be stopped at the same time. In order to ascertain from time to time the degree of concentration of the liquid under operation, the small cock A 2, fig. 24, is to be opened, and the liquid will flow into the cup B 2; the cock is then shut, and the cup removed, and the density of the liquid tried by means of an hydrometer. When the operation is completed, the heat is shut off from the boiler, the agitator stopped, andthe cock T is opened to draw off the concentrated liquid into appropriate vessels. Operation of the same apparatus with the ventilator:—The only difference is, in the conical aperture E, fig. 15, which is closed by a cover, fastened by a joint Q, Q, from which arises the pipe *s* 2, connecting the ventilating box T, to the boiler. After the fire is lighted, and when the temperature has reached about 124 degrees Fahrenheit, the agitator and ventilator are both set in motion, and as the steam or vapour rises from the boiler up the pipe *s* 2, the ventilator draws them with rapidity into the worm pipe *s'*, fig. 22, where they become condensed by the cold water in the tank T', the condensed water passing from the box into the recipient, connected to the lower end of the pipe *s*, which recipient is provided with a glass tube, graduated to enable the operator to ascertain the quantity of condensed liquid which has been collected, and this quantity should correspond to that which it was desired to extract from the solution under operation. The state of operation may also be ascertained by means of the cup B 2, fig. 24, which enables the workman to ascertain the density of the liquid by means of an hydrometer. The operation being completed, the damper or register *h* 2, is closed, and the agitator and ventilator are both stopped. When the ventilator is used, the agitator may be dispensed with. If this apparatus is intended to be used for distilling sea-water or evaporating brine, all the parts of the apparatus should be made of tinned copper.

Concentration and evaporation in vacuo of syrups and other liquid solutions:—The apparatus is shown in elevation at fig. 17. The concentration and the boiling of syrups, &c., in vacuo is effected by means of the boiler and apparatus, fig. 17. The boiler has an outer casing, or double bottom or bath, and may be made with or without fluting or corrugations, and set in connexion with a furnace similar to the one used for the torrefying apparatus. The vacuum is produced by the condensation of steam passed from a generator *e*, by a pipe F, with a proper stop-cock ; this pipe is connected with the top of the evaporating vessel, and leads to the centre of a condensing apparatus or refrigerator, divided into two parts, the upper part is formed of several closed chambers; I, I, fluted internally, to increase the surfaces, and the lower part is formed of several thin closed chambers, K, K, not fluted; these chambers are placed over one another in a worm or zig-zig shape, and communicate with one another by their position, from a series of condensing chambers or kind of worm for condensing the steam. An outer casing surrounds this worm or condenser, within which cold air is introduced by means of a ventilator. I shall now proceed to state the manner of producing the vacuum. The steam or vapour from the evaporating vessel first rises into the upper part of the serpent or condenser, and travelling along all the fluted chambers, arrives at the left hand one of the two condensing vessels N, which is provided with two cocks; the one for the introduction of steam, and the other to allow the exit of the air driven out by the steam. This condensing vessel is air-tight, and has no opening except at the bottom, and is plunged in a tub or tank filled with water, and when the vessel N is full of steam, the air-pipe is closed, and the cock of another pipe placed in the lower part of the condenser is opened, and a stream of water from a reservoir placed above the condensing vessel being injected into the vessel filled with steam, a condensation takes place, and the condensed steam descends from the upper part of the refrigerator into the lower part, and falls through a pipe into a recipient, together with all the air it may have carried with it; thus a vacuum is produced in the apparatus. On this being done, the cock placed in the lower part of the recipient must be shut, as also the pipe which conducts the steam into the boiler. The apparatus being in this state, and so prepared, the register of the furnace is opened to give the heat access to the boiler. After the pipe connecting the boiler with the tank, containing the liquid to be operated upon, has been opened, and as soon as the vapour or steam begins to rise, a current of air is introduced into the case of the condenser or refrigerator from the bottom, and this air acts on the external surface of the refrigerating chamber, within which the steam from the boiler is rising, and continually cooling them, while the evaporation or boiling of the sugar takes place. The same effect may be produced by water or a suitable liquid running on the flat chambers, or both water or air may be employed in the condenser or refrigerator if desirable.

If saccharine or other solution be used for cooling the condenser, in conjunction with the ventilator, the upper surface of the chambers of the condensers should form shallow gutters or troughs. The syrup or solution must arrive by two separate pipes, one leading to the surface of the eighth or upper fluted chamber I, and the other on the third or upper chamber K, reckoning from the bottom of the apparatus. All these gutters are to be surrounded by woollen or cotton cloth, and syrup or solution will be transmitted from gutter to gutter, and on all their surfaces, and become cooled by their exposure to the air introduced by the ventilator; and thus will be produced a considerable concentration of the juices, which must be collected as they pass from the condenser in suitable vessels. In order to preserve the vacuum in the apparatus, while a certain quantity of air and vapour is collecting in the upper or left hand condensing vessel, which is in connexion with the condenser or refrigerator, the vacuum will be created in the right hand upper condensing vessel N, by means of a pipe, with a cock, leading the steam to the top of this right hand vessel, and out by another air-pipe placed at the bottom of the same. The two condensing vessels are each plunged in a tank, filled with cold water, used for condensing the steam. As soon as the action of the vacuum is lessened in the whole apparatus, the cock connecting the condenser with the left hand vessel is shut, and immediately after the small cock *o'*, must be opened, and a few seconds afterwards the large cock *o* 2, which establishes a communication from the condenser or refrigerator to the right hand condensing vessel, wherein the vacuum has been previously created, the small cock *o*, must be closed as soon as the large one *o* 2, is opened. This operation is repeated by using, alternately, the right or left hand condensing vessels as often as is necessary, to maintain in the apparatus the vacuum down to the proper degree.

The required degree of concentration of the liquids operated upon, will be ascertained; firstly, by means of the graduated tube fixed to the left hand recipient, placed under the condenser, which indicates exactly the quantity of water to be extracted from a given quantity of liquid; secondly, by the time employed in the operation, which time is invariable, if precautions have been taken to maintain the oil bath at a constant temperature, and the vacuum at the same degree which is indicated by the vacuum gauge; thirdly, until the workman is well accustomed to this apparatus, he may ascertain the progress of the operation by extracting from time to time some of the liquid by a cane or hollow tube passed into the boiler in the ordinary way; fourthly, a cup screwed on the end of a small pipe, with a stop-cock attached to the pipe which is used to empty the boiler, will admit of a small quantity of liquid being extracted, the density of which may be tried by an hydrometer. When the operation is terminated, the air must be admitted into the boiler through a small cock placed in the top of the boiler; the cock for emptying the boiler must then be opened, and the concentrated fluid allowed to run off into appropriate vessels. If it is wished to operate upon weak juice, or to continue the evaporation for a length of time, the capacity of the left hand recipient placed under the condenser may not be sufficient; then the vacuum must be created in the right hand recipient, and after shutting the cock of the pipe connecting the left hand recipient with the condenser, then the cock of the pipe, leading from the right hand recipient to the condenser, must be opened.

Observations:—The condensing vessels described as placed above the condenser or refrigerator, may be placed below it or in any other situation, and their capacity may be varied. In case the evaporating boiler should be made larger, the capacity of all the other parts should be increased in the same proportion, and the chambers of the condenser or refrigerator must be multiplied, either by placing them above the others, or in two rows; in this case, the pipe leading from the boiler should branch into two openings, so as to conduct the vapours to the two rows of chambers.

Description of the figures representing the apparatus for boiling and evaporating in vacuo, constructed as above stated:—Fig. 17, general elevation of the apparatus; A, A, is the furnace similar to the one used for the torrefying apparatus; B, is the boiler, with a fluted or corrugated bottom; *c*, casing or double bottom, forming the bath *d*, containing oil up to the escape pipe *d* 2; *e*, is a steam generator, in connexion with another furnace; F, is a pipe with a stop-cock *a'*, conducting the steam from the generator into the boiler; *g*, is the pipe conducting the steam to the middle part of the condensers or refrigerators I, K, a vertical section of which is shown at fig. 18; H, is a globe on the pipe *g*, which may be dispensed with, if a greater diameter be given to this pipe. The upper chamber I, of the condenser or refrigerator are constructed as shown in fig. 18, which also represents a section of the lower ones K; N, N, are the two upper condensing vessels receiving the steam after it has passed through the upper chambers of the condenser or refrigerator; *p,' p,'* cocks placed at the bottom part of the vessels N, N, and which must be opened alternately to allow the air to escape whenever it is requisite to create the vacuum in these vessels; *o*', *o*', small pipes connecting the vessels N, N, with the condenser, below the pipes *o* 2, *o* 2, which latter pipes are furnished with cocks, through which the condensed steam and air pass downwards through the chambers I, K, of the condenser in their way to the recipient, when the cocks *p*,' *p*', of the condensing vessels have been shut, and the cocks Q', Q', of the recipient should be opened. The recipients *s*, *s*, are capable of containing a quantity of water, greater than that which is to be extracted from the syrup during the operation. These recipients receive the air and steam conducted by the pipe Q, and the air at the same time escapes through the cock Q', which must be shut when the vacuum is produced in the apparatus; *p*, is a joint, uniting the recipients T, T, to the condenser or refrigerator; W, graduated tubes indicating the quantity of water extracted from a quantity of syrup. In the interior of these tubes, a thermometer is introduced to indicate the temperature of the condensed water. Fig. 18, *q* 3, *q* 3, steam pipes proceeding from the generator; they are provided with cocks, that the vacuum may be alternately created in each recipient S, T, S, T, which may be plunged into vessels supplied with a stream of cold water, to condense the steam which is used to create a vacuum therein; X, (fig. 17,) is a pipe with a stopcock, which conducts into the boiler the liquid to be concentrated or evaporated; Y, is the recipient for the said liquid or solution, into which the pipe X, opens near the bottom. The workman is enabled to reckon the exact quantity taken into the boiler at each operation, by means of the graduated tube *v*, placed at its lower part; z, is a ventilator, which is brought into action as soon as the liquor is introduced into the boiler, the cocks *q'*, *a'*, and *g*, having been previously shut. This ventilator forces the air into the lower part of the case of the condenser or refrigerator, in quantity sufficient to cool rapidly the liquor passing through it. The air thus forced up, passes in the direction of the arrows, and escapes at the top part. The liquid solution which is directed from the reservoir N', on to the troughs of the outer surface of the chambers, runs through pipes *p* 3, *p* 4, provided with cocks near the vessel N', which is filled with the juice or solution to be evaporated; one of the pipes *p* 4, brings the juice on to the surface of the upper chamber I; the other pipe *p* 3, conducts the juice on to the surface of the other chamber K. The chambers being surrounded with woollen or cotton cloth, as shown by lines in fig. 18, the liquid is then transmitted slowly on to the surfaces of the chambers successively, and cools them conjointly with the air driven through by the ventilator, by which means a rapid condensation takes place, and, at the same time, the density of the liquid employed as a cooling medium is increased without expense of fuel. The liquid or solution distributed on the upper chamber I, drops down to the fourth chamber, where it runs out through the cock *q* 4, (fig. 18). The liquid directed on the upper chamber K, is delivered by the pipe *q* 5, (fig. 18); small pipes *q* 6, connected with the gutter of each chamber, allows the liquid contained in these gutters to be drawn off at the end of each day's work; *c'*, *c'*, fig. 17, is the box or case of the condenser or refrigerator, a sufficient space for the free circulation of the air being left around it; *c* 2, *c* 2, are the tanks containing the condensing vessels, and the water to cool them is supplied by the pipes *c* 3, provided with cocks, and communicating with the reservoir N 2. There are two pipes T^1, T^2, to allow the excess of water to escape; *h'*, is a thermometer, indicating the temperature of the oil, or any other substance contained in the bath of the boiler; *i'*, is a cock to introduce the air into the boiler when the liquor is to be drawn off. Fig. 19, is a detached view of a small funnel or vessel to be placed on the top of the boiler, and is furnished with two cocks, between which there is a globe containing butter, or other such like oleaginous substance, which is introduced into the globe by shutting the lower cock, and opening the upper one. When the globe is filled, the upper cock is shut to prevent the admission of air; the lower cock is opened to introduce into the boiler a proper quantity of butter; K', in fig. 17, is a glass tube, indicating the quantity or thickness of the layer of butter introduced into the boiler to check the rising or ebullition of the liquor. Fig. 20, shows the cupola or upper part of the boiler, in which are introduced glasses through which the interior of the boiler may be inspected, while the operation is going on; *o'*, fig. 17, are the pipes for introducing steam into the vessels N, N, to create a vacuum therein; the pipes and cocks p^1, p^2, allowing the air to escape. On the top of these vessels are fixed two small pipes, communicating with the two vacuum gauges *v* 2, *v* 2, shown detached at fig. 25. Fig. 24, is a side elevation of the boiler and furnace; A 2, is the trying cock, placed on the large cock T, for emptying the internal boiler; X 2, is a pipe communicating with the reservoir B 2, and is provided with a cock, to introduce liquor already warmed into the boiler, which liquor is warmed by the heat which escapes from under the evaporating boiler; fig. 26, is a detached view of the communication of the boiler to the condenser or refrigerator, and from thence to the lower recipient; fig. 27, is a detached plan of one of the fluted chambers I, of the condenser, with its cocks J. fig. 28, section of one of the upper condensing vessels N, with its tank c 2; fig. 29, section of the recipient, containing the liquid about to be introduced into the boiler.

Observations:—In conclusion, I would remark, that the evaporating and concentrating boiler may be set on the naked fire, or, if a heating medium be used, oil, hot air, steam, or any other compound, suited to the purpose, and capable of taking up and giving out a sufficient quantity of caloric to effect the evaporation and concentration of the liquids operated upon; and further, that the various parts of the condenser or refrigerator, consisting of the two vessels N, N, the two recipients placed below the condenser, the box T, raised about thirty-five feet above the boiler, and provided with a rotary fan or ventilator for drawing up the vapours, either separately or jointly, may be applied to the various evaporating apparatus, established on other systems.

Having now particularly described the application of this improved apparatus to the purposes of evaporating syrups or liquid solutions, and the modifications and additions necessary for carrying the same into effect, I wish it to be understood that I do not mean or intend to claim as novelties in this part of the application of an oil or other bath to the boiler, nor the corrugated or fluted bottom of the boiler or evaporating vessel, nor the evaporating of the aqueous parts of the solutions or syrups, by passing them over the surface of shallow trays from one to another, as they are all old contrivances, and have been before carried into effect; but what I consider novel under this application of the apparatus, is the manner of effecting the vacuum by the two upper condensing vessels, in connexion with the refrigerator or condenser, and its ventilators or rotary fans, and also the general arrangement and construction of the apparatus in the various modifications above particularly described.—[*Inrolled in the Rolls Chapel Office, December,* 1836.]

Specification drawn by Messrs. Newton and Berry.

To Isaac Dodds, *of Horseley Iron-works, in the parish of Tipton, in the county of Stafford, engineer, for his invention of certain improvements in the construction of fire-arms, part or parts of which improvements may be applied in the making and using of common and other ordnance.*—[Sealed 30th April, 1835.]

These improvements in the construction of fire-arms apply, firstly, to the locks by which fire-arms are discharged; secondly, to peculiar constructions of the breeches of fire-arms and modes of loading them; thirdly, in the construction of ordnance, with a plurality of barrels; and, fourthly, in the arrangements of machinery for boring the internal surfaces of the barrels of fire-arms.

Fig. 1, Plate XIV., represents the internal construction of a lock for an ordinary musket, in which the moving spring has a greater range of elastic action, is more powerful and strong, and is so situate as to require a shorter lock plate than those of the usual construction. The spring is formed nearly like an ordinary main spring, *a*, *a*, being the tail as usual, but the affixing or fulcrum end is extended, as at *b*, *b*, over the tumbler, The screw by which the spring is affixed to the plate is shown at *c*; and *d*, is the stud which constitutes the stop or fulcrum. By this arrangement, it will be seen that, in addition to the elasticity of the part *a*, *a*, the part *b*, *b*, will also be a spring up to the fulcrum or stop *d*.

Fig. 2, shows the bridle piece detached, through which the end of the axle of the tumbler works, and it is affixed to the lock plate by the screws of the main spring, the sear, and the sear spring; by which means greater stability is given to the main spring than in the ordinary construction of musket locks. The back end of the spring at *e*, forms the stop for the tumbler.

Fig. 3, represents the interior of a gun lock for discharging upon the detonating principle; *a*, is the tumbler, to the axle of which the cock *b*, is attached in the usual way. The main spring is shown at *c*, *c*, as a double-armed lever, affixed to the lock plate by the screw *d*. The fulcrum of the longer arm of the spring is a stud at *e*, let into the lock plate, and the screw *d*, is the fulcrum of the shorter arm of the spring. The sear *f*, turns upon a pin *g*, and is acted upon by a spring behind, the under part of the sear at *h*, constituting the trigger, by which the piece is to be discharged. A bell-crank lever *k*, turning upon a pin at *i*, is connected by a link *l*, to the lower part of the tumbler *a*; and the upper part of the tumbler also carries a link *m*, which is connected to the end of the longer arm of the main spring. The lower part of the bell-crank lever is elongated at *o*, and extends through the guard plate of the lock, for the purpose of enabling the lever to be worked by the finger of the sportsman, and a guard *p*, *p*, protects the end of the lever and also the trigger. In cocking the piece, the finger is applied to the tail *o*, of the bell-crank lever, which being drawn back into the position shown by dots, causes the tumbler to be brought round, and the longer arm of the main spring to be raised into tension; and, by the same movement of the tail *o*, a small beak *q*, at the back of the bell-crank lever, acting upon the end of the shorter arm of the main spring, brings that end of the spring into tension also, the points of the sear *f*, by the pressure of the sear spring being at the same time forced into one of the notches of the tumbler, which confines the lock in the position of half or full cock. The piece being thus half cocked or cocked, the locking bolt *r*, may be slidden under the point of the sear by the finger, or by the force of a small spring; and, whilst in this position, the trigger *h*, cannot be moved, the sear being confined by the bolt *r*; but, on sliding back the bolt *r*, which may be readily done by the finger when the piece is brought to the shoulder, the sear is released, when, by pressing the trigger *h*, the point of the sear will be withdrawn from the notch in the tumbler, and the force of the main spring then acting upon the tumbler, will bring it and the cock down with great force, and cause the end of the cock to strike the detonating cap placed upon the nipple of the touch hole, by which the piece will be discharged. It must be obvious that the fulcrum or fulcrums of the double-armed main spring may be placed in other positions beside those pointed out, perhaps, with similar advantage. It will also be perceived that the piece may be cocked without employing the bell-crank lever and tail piece *o*, merely by raising the cock in the ordinary way.

Having described the internal arrangements of this construction of lock, I would add that a plate may be placed over the works, parallel to the face plate, for the purpose of enclosing and giving greater stability to the whole, and excluding moisture and dirt from the interior.

Fig. 4, is a transverse section taken through the two locks of a double-barrelled gun, constructed upon the principles last described. Here, it will be perceived that the boxes which contain the mechanism of the locks are formed by one middle plate and two side plates conjoined to the upper plate and guard plate.

Fig. 5, is a longitudinal section of a fowling piece, having a back action lock enclosed within the stock; and fig. 6. is a transverse section of the same. These figures show another modification of gun lock, which, with the cock, are entirely enclosed within the stock of the gun. The lock may be constructed between two parallel plates, as before described, and as my improved arrangement of the sear, trigger, and safety bolt. The upper part of the cock is formed as the segment of a circle, and moves coincident with the top of the tail piece of the breech. A small lever attached to the top of the cock rises by a spring when pressed by the thumb, for the purpose of affording the ready means of drawing the cock back.

Fig. 7, shows a sectional elevation of a series of elliptical springs, conjoined for the purpose of obtaining sufficient force to discharge a percussion primer: *a, a, a,* are the springs, connected together by pins; *b, b,* is a forked frame carrying the springs, the back end of which fork is connected by a link *c,* to the tumbler lever *d.* The tail of the tumbler lever extends through the guard plate at *e,* and which, when drawn back, compresses the springs against a stop piece *f,* and thus puts the springs in tension; and the point of the sear *g,* being forced by a small spring into a notch in the tumbler, confines the lock ready to be let off, which is done by drawing the trigger *h.* The box containing this lock turns up in the stock on pivots in the side plates, for the purpose of introducing the detonating primer into a recess in the end of the plunger at *i.*

Fig. 8, is a side view of a pistol on a peculiar construction, the cock of which forms also a tumbler, containing a convolute spring within a circular groove, seen at *a*, part of the face plate of the cock or tumbler being removed for the purpose of showing part of the spring within. One end of this convolute spring is made fast to the plate of the tumbler or lock, the other end to the plate of the lock. Hence it will be perceived, that by drawing back the cock, the spring will be drawn into tension, and the point of the sear *b*, falling into a notch in the edge of the tumbler, will confine the cock until it is let off by the trigger, as in other constructions of locks.

Fig. 9, is a horizontal view of the pistol seen in the side view at fig. 8; and fig. 10 is a front view of the same. The pistol here represented has four distinct breeches *c, c, c, c*, each capable of receiving a distinct load of powder and shot. They are formed as a wheel, with hollow arms or chambers, shown detached from the pistol at figs. 11, and 12. Apertures in the periphery of the wheel at *d, d, d, d*, admit the powder and ball for each charge; and the nipples *e, e, e, e*, respectively receive a detonating cap, each nipple communicating with its own chamber *c.* The wheel is held in connexion with the pistol by a circular clip *f, f*, which opens and closes upon a hinge joint *g.* The interior of the clip is made hollow to fit the curved periphery of the wheel. One semi-circular portion of the clip *f*, is made fast to the stock and lock plate *h*, and the other semicircular portion carries the barrel *i.* When the wheel is placed within the clip, as shown at fig. 8, the clip is drawn up tight by screws *k*, *k*; and by means of these screws, the clip will be made to embrace the periphery of the wheel, and allow it to turn within the clip with any degree of tightness. The wheel is turned round within the circular clip by means of an arm or lever *l*, which carries a click *m*, taking into a ratchet wheel *n*, affixed to the side of the wheel, and a spring catch must be attached, so as to drop into notches in the edge of the wheel, for the purpose of stopping the wheel in such positions as shall keep the mouths of the loaded chambers when brought round in exact coincidence with the barrel *i*. The action of the lever may be made to raise the cock, if required, by means of a connecting link, or levers, applied in a variety of ways. A modification of this mode of adopting a moveable breech is shown in longitudinal section at fig. 13, and in plan view, at fig. 14; in which one loading chamber only is employed; *a*, is the breech piece for receiving the loading, which piece is mounted upon pivots *b*, *b*, in the top and bottom plates *c*, *c*. A lever or handle *d*, on the side, affords the means of withdrawing the breech piece from coincidence with the barrel, into the position shown by dots in fig. 13, when the loading may be introduced through the oblique aperture *e*; and, after charging, the breech piece must be brought again into coincidence with the barrel, in the position shown in the figure. A detonating cap being now placed upon the nipple, the piece may be discharged by a lock similar to that shown at fig. 7, or in any other way, either upon the percussion or flint principle, as may be thought most desirable.

"In this construction of gun or pistol with moveable breech pieces, I do not intend to confine myself to any particular number of breech pieces, nor to any peculiar mode of adjusting them, as locks of various constructions may be applied. My improvements, in common, consist in combining several barrels together, in order that the loading may be performed with greater facility than in the ordinary construction."

Fig. 15, is a side view of the barrels of four cannons, conjoined at their breeches, and mounted upon pivots or trunnions extending from the centre. Fig. 16, is a front view of the same, two barrels only combined at their breeches, in a similar way, might be made to turn upon trunnions, as at fig. 17, which represents two barrels conjoined; fig. 18, being a front view of the same. The trunnions are here placed some way up the barrels for the purpose of economising length. By these constructions, one barrel may be loaded whilst the other is preparing for firing, which will not only save time, but also allow the barrels to cool after firing, before loading again. The barrels may be attached so that their axis shall be coincident, or they may be placed side by side, or one over the other; and they may be so mounted as to turn upon their trunnions either horizontally or vertically.

Fig. 19, represents a machine, partly in section, intended for the purpose of boring common and other fire-arms, in which the gun to be bored is inverted and held in a frame, descending gradually as the metal becomes bored away. The frame is suspended by chains passed over pulleys, with balance weights, and may descend by its own gravity between guides, or it may be conducted by a rack and pinion moved by machinery from below. The boring bit is erect, and acts upward within the cylindrical barrel; and there is a shield beneath to prevent the small particles of metal which fall from passing into the working parts of the machinery. This machine may be placed at any oblique angle to the horizon, the object being simply that the turnings or borings may be enabled to descend by their gravity, and not obstruct the operation of the boring bit.—[*Inrolled in the Rolls Chapel Office, October*, 1835.]

Specification drawn by Messrs. Newton and Berry.

To JOHN PARKINSON, *of Rose Bank, in the parish of Bury, in the county of Lancaster, calico printer, for his invention of certain improvements in the art of block-printing*.—[Sealed 19th April, 1836.]

THIS invention, in the art of block-printing, applies particularly to that branch of the same, in which it is desirable to print two, three, or any other required number of colours, upon velvets, muslins, calicoes, or any other article or manufacture capable of receiving them; and is accomplished by forming the whole of a many coloured design or pattern upon one block, and imparting to each particular portion of the block its respective colour in a novel and effective manner, instead of using a separate block to fill in each colour as required; and it will also be seen that my improvement in the manner of laying the colours or spreading them upon the surface of the sieve or elastic bed (upon which they are laid), after each dip of the block has been performed, will prevent the necessity of each colour forming stripes either in the length or cross way of the piece, which is to be printed; but each colour may be arranged in any form varying from the stripe or straight line in any way, either vertically or diagonally, and may be spread or laid upon any part or parts of the sieve to suit the required position of each colour in the design or pattern to be printed.

It is necessary, in the common process of printing calicoes or other fabrics with one colour, that an attendant be placed at the "swimming-tub" or elastic bed, upon which the sieve containing the colour is placed, for the purpose of re-spreading the colour over its surface after each dip of the block has taken place; this is done in order to present an even surface of colour to the face of the block, that all parts of the same may take up an equal portion of the colour, and, consequently, prevent the appearance of inequalities in the printing upon the surface of the fabric under operation. Now the principal object of my improvement, is to effect this operation of re-spreading or mixing up of the colours upon the sieve in certain portions or spots upon its surface, and at the same time prevent them from being mixed or blended with each other, which would entirely prevent the possibility of taking up any separate portion of the colour upon its required place on the block.

"In order that my improvements may be more fully explained and better understood, I have appended to these presents a drawing, containing different figures and views of the subject of my improvement, and marked the same with letters of reference, which are placed upon each corresponding part in all the figures."

Fig. 1, Plate XV., is a horizontal or top view of part of the improved apparatus; and fig. 2, a sectional elevation taken longitudinally through the same; *a, a, a, a,* is the ordinary "swimming-tub" or vessel containing the glutinous mixture, which forms an elastic bed for the sieve or cloth *b, b*; upon this sieve the colours are deposited, ready to receive the dip of the block upon which the pattern or design to be printed is formed in relief, as in ordinary printing; *c, c, c,* is a framework of wood, or other suitable material, attached to the swimming-tub, and upon the inner side of this trough or frame, slips of wood are fixed, for the purposes of forming slides and grooves as at *d, d, d*; at that end of the frame *c, c,* which shall be on the right hand of the operator, there is a series of small pots or vessels *e, e, e, e,* containing the various colours to be printed from; and when it is desired to lay the colours upon the surface of the sieve *b, b,* in commencing the operation of printing; this is done by dipping a system of small brushes, fixed in a board or bed, with a handle conveniently adapted for this purpose, into the vessels *e, e*; this series of brushes is shown in the detached figs. 3, and 4; and it will be seen that the brushes *f, f,* are made to correspond with the centres of the vessels of colour, so that when the brushes are dipped into the vessels by the hand of the workman, a certain portion of each colour is taken up by each brush; there are, also, elastic springs *g, g,* affixed to the board or box containing the vessels of colours, for the purpose of preventing the brushes from being dipped too deep into the vessels, and thereby taking up any impurity or sediment which may have been deposited in the same. The brushes being now charged with colours, are to be slidden down the grooves or way formed by the ribs or projecting pieces *d, d,* and the colours deposited or left upon the surface of the sieve cloth *b, b,* as seen in fig. 1, and then the brushes removed. When this is done, another system of larger brushes *h, h, h,* is to be slidden down the way or groove; and when they are immediately over the spots or portions of colours left by the former brushes, the winch or handle *i,* is to be smartly turned round by the hand of the attendant, when the whole system of brushes will be made to revolve, each upon its own pivot or centre, and thus spread or lay the colours evenly upon the sieve cloth; and, as the diameters of the brushes *h*, *h*, must be of the same size as the required portion of the colours, they will always work up or spread each colour separately, and at sufficient distance to prevent their coming into contact or mixing with each other. After the colours have been sufficiently spread upon the surface of the sieve cloth, the brushes may be lifted again up the groove, which operation is assisted by the levers by which they are suspended, and counterbalance weight *i*, and slidden along the rib or projecting piece or rail *d*, *d*, that the block may now, in its turn, be introduced on to the surface of the sieve, in order to take up a portion of each colour that has been spread, for this purpose; and it is to be observed that the revolving brushes are to be worked upon the sieve cloth after every dip of the block, so that the colours may always be kept evenly spread or laid; but the small brushes, for giving a fresh supply of colours from the vessels *e*, *e*, *e*, are only to be used when the operator shall find that a fresh supply is requisite.

"In the detached views, figs. 5, and 6, I have shown the system of revolving brushes, and the manner of driving them; fig. 5, being a plan or horizontal view of the face of the brushes, and seen just as they have been removed from the sieve cloth; and fig. 6, is a plan or top view of the gearing necessary to drive the brushes, or cause each to revolve upon its own centre: this gearing and a side view of the brushes is also shown in the system of brushes suspended over the "swimming-tub" in fig. 2. It will be seen that the winch or handle *i*, is connected by a socket to the centre of the pinion on the middle of the set of revolving brushes; and this pinion, on being turned, will give a rotary motion to the whole series of brushes, as the pivot of each brush is furnished with a small wheel or pinion for this purpose, which will be very readily perceived by reference to fig. 6.

"I have also thought it advisable, in order to prevent any part of this improvement from being misunderstood, to show a pattern after it has been printed by the block, which has taken up its various colours and left them upon the surface of the fabric intended to be printed; and this impression is represented at fig. 7.

"In conclusion, I wish it to be understood that although I have shown in the drawing only one mode of effecting the object required, it will be evident that, as there are other modes of varying the manner of causing the brushes *h*, *h*, *h*, to revolve, I do not mean to confine myself to any particular manner of doing the same, nor do I intend to determine any particular size or arrangement of the said brushes, as a centre might be formed of one colour having a ring of another colour around it, and so forth, by a different arrangement of the bristles or hairs forming the brushes; and it will also be understood, that, instead of brushes, small cushions of leather or other material may be used in place of the said brushes. But, I do claim any method by which spots or compartments of two or many colours are kept in a proper state for the preservation of the block in all processes of block-printing, and thereby properly spread and laid upon the surface of the sieve cloth after the manner I have described in this my specification, in which I presume I have fully complied with the intents of the proviso made in the grant of the above recited Letters Patent."—[*Inrolled in the Rolls Chapel Office, October*, 1836.]

Specification drawn by Messrs. Newton and Berry.

To WILLIAM COLES, *of Charing-cross, in the county of Middlesex, Esq., for his invention of certain improvements applicable to locomotive-carriages.*—[Sealed 16th December, 1835.]

THE Patentee describes his invention as being more particularly applicable to that description of locomotive-carriages called railway carriages, and consists in reducing the friction of the wheels. The way in which this is carried into effect, we give in the Patentee's own words.

In Plate XV., at figs. 8, 9, 10, and 11, A, is the upper part of the frame, sixteen feet long, six inches deep, eight inches broad, and substance one inch; B, is the lower part of the frame, ten feet six inches long; the ends *b*, *b*, each six feet; the narrow part B, four feet six inches; *b*, six feet long, eight inches broad, six inches deep, and two inches raised at the axle boxes; C, are guides in the form of crosses fixed to the inner sides of the frame A, and to the outer sides of the ends *b*, *b*, with a nave in the centre of these parallel guides, to contain the axle for the friction wheel D, which is one foot nine inches in diameter, six inches broad, resting on the axle C, of the wheel E, which runs on the rail: E, is a cast iron or spoked wheel, two feet six inches in diameter; *a*, *a*, *a*, *a*, are four braces, fixed to the centre of the frame A, above, and upon the frame *b, b, b, b*; *d, d, d, d,* are four cross bearings at the lower ends of the parallel guides secured to the four points *d,* on B.

Now, the object of this invention is the reducing of the friction of the axles of railway carriages by the application of the friction wheels D, resting on the axles at C, of the wheels E, which run on the rails of the railway, the axles C, being prevented from getting out of their proper position, by the parallel guides C.—[*Inrolled in the Inrolment Office, June,* 1836.]

To ALEXANDER MASSIE, *of the parish of St. John, Wapping, in the county of Middlesex, engineer; Robert Morton, of the same place, engineer; William Ranwell, of Woolwich, in the county of Kent, coal-merchant, and Ebenezer Ranwell, of the same place, miller, for certain improvements in the construction of paddles, or paddle-wheels, for propelling of vessels, which improvements are also applicable to the construction of water-wheels for mills.*—[Sealed 9th February, 1836.]

THESE improvements in the construction of paddles or paddle-wheels for propelling vessels on water, or for driving mills by water power, consist in constructing the paddles or float-boards of paddle-wheels and water-wheels, with sliding shutters or tumbling flaps, by means of which the resisting surface or face of each paddle may be partially opened in order to allow the water to flow through it, or completely closed and made to present its greatest resisting surface to the water.

The manner in which we propose to construct the paddles or float-boards of our wheels, and the machinery for working them is shown in Plate XV., fig. 12; represents the face of one of the float-boards of a paddle-wheel, which is formed by a frame of open rails fixed to two parallel radial arms. The spaces between these open rails are intended to be closed by a similar frame of open rails sliding upon the face of the fixed frame; *a*, *a*, are the radial arms of the wheels attached to the shaft or axle *b*. The fixed frame of open rails *c*, *c*, *c*, which is to constitute the paddle, is securely attached to the radial arms *a*, *a*. The sliding frame of open rails *d*, *d*, is held against the face of the fixed frame by rebates or brackets *e*, *e*, extending from the arms of the wheel, or by any other convenient means.

A lever *f*, at the side of the wheel, is mounted between brackets, upon a fulcrum pin at *g*, the lower end of which lever is attached to the sliding frame *d*, by a joint at *h*, and the upper end of the lever, as the wheel revolves, works in an inclined circular groove in the stationary box *i*, which is intended to be fixed to the side of the vessel. Fig. 13, is a side or edge view of one of the paddles, showing the lever by which the sliding shutter is moved with one of radial arms of the wheel, and also the stationary box in the periphery, of which the inclined circular groove is formed, that works the lever as the wheel revolves, and thereby gives the sliding lateral movements to the shutters of the paddle.

Fig. 14, is a similar view of the paddle to that represented in fig. 12, in which the sliding frame has began to move, and the spaces between the rails of the fixed frame have become partially open.

As the wheel revolves, the spaces between the fixed rails of those of the lower paddles, which are acting against the water, will be closed by the inclined circular groove in the stationary box *i*, having caused the levers to bring the sliding frames into the closed positions; while those of the paddles, which are rising up through the water, are opened to avoid the resistance of the water and air against the faces of those paddles that have passed the propelling position. The descending paddles also, by remaining open until they arrive at the propelling position, avoid much of the impeding effect of the back-water.

Another modification of our invention of improvements in paddle-wheels, consists in constructing them with tumbling-flaps, which may be opened for the purpose of allowing the free passage of the water; or closed, so as to oppose the entire surface of the paddle to the resistance of the water.

Fig. 15, represents in perspective one pair of the radial arms of a paddle-wheel detached from its axle, and having two tumbling-flaps to form the paddle; *a, a,* are the arms connected by a brace at their outer extremities; *b, b,* are the tumbling-paddles, turning on an axle or on pivots *c, c,* at their ends, which are inserted into the arms. From the ends of the paddles, there are also studs *d, d,* extending, which are intended to work either in slots or in the notches *e, e,* of a sliding rod or bar *f,* at the side of the arm.

Fig. 16, is an edge view of one of the arms of the paddle-wheel, with the two tumbling-flaps thrown open by the acute parts of the notches *e, e,* acting against the studs *d, d,* and as the rod or bar *f,* moves inward, drawing back the flaps into the inclined positions shown. Fig. 17, is a similar edge view of one of the arms of the paddle-wheel, the rod or bar *f,* being moved outward, and the curved parts of the notches *e, e,* acting upon the studs *d, d,* having forced the tumbling flaps *b*, *b*, into coincidence with the direction of the arm *a*, which is their most effective propelling position. Fig. 18, is a side elevation of a propelling wheel, having paddles formed by tumbling flaps as last described. An anti-friction roller *h*, at the inner extremity of each of the rods or bars *f*, works against a stationary excentric cam *l*, attached to the side of the vessel. This cam *l*, is so formed and situate, that the anti-friction rollers *k*, *k*, *k*, at the inner ends of the rods *f*, *f*, *f*, acting against its larger radius as the wheel revolves will cause the rods to be moved outward, and thereby to close the flaps as shown at fig. 17, which is their most effective propelling position; but on the paddle having passed through its propelling stroke, the flaps are to be thrown open as at fig. 16, for the purpose of enabling them to rise freely through the water, which is done by the anti-friction rollers passing round the lesser radius of the cam, and thereby moving the rods inwards. This operation is further promoted by a groove formed at *u*, which forces inward the anti-friction rollers *k*, as they pass.

We have said that the box *i*, having the inclined circular groove, is fixed to the side of the vessel, and also that the cam *l*, is in like manner fixed, which must be the case while in operation, in order to open and close the shutters or flaps of all the paddles successively at the proper times as the wheel revolves. But as it may be desirable under some circumstances to open and close the sliding shutters or tumbler flaps at other parts of the rotation of the paddle-wheel, than those described, we find it convenient to attack the box *i*, or cam *l*, to the side of the vessel in such a way that it may be readily turned round, in order that the inclined part of the circular groove or excentric part of the cam may be brought to act upon the levers, rod, or bars, *f, f, f,* at such parts of the rotation of the wheel as may be desired.

Having described the nature of our invention, viz., the adaptation of sliding shutters or tumbling flaps to paddle-wheels, we desire it to be understood that we do not intend to confine ourselves to the particular modes of working them, shown in the drawings; as other mechanical contrivances to effect the same might be devised, which would answer the purpose equally well; but we claim as our invention, first, the constructing of paddles or floats for propelling vessels on water, or for water-mill wheels with sliders or flaps, by which their resisting surfaces may be increased or diminished; secondly, the formation of such sliding shutters, with indented surfaces, which we find take hold of the water with greater effect than if formed with plain surfaces, and consequently render a narrow wheel, or one with short floats or paddles, on our construction, as effective as a wheel with much longer floats or paddles on the ordinary construction.—[*Inrolled in the Rolls Chapel Office, August,* 1836.].

Specification drawn by Messrs. Newton and Berry.

To Francis Gybbon Spilsbury, *of Newman-street, Oxford-street, engineer, for his invention of certain improvements in machinery or apparatus for stamping up, and compressing metals or other substances*:—[Sealed 22nd March, 1836.]

The object of this invention is to supersede the necessity of employing two dies, the one convex and the other concave, in obtaining impressions upon thin plates of metal. To accomplish this, the Patentee proposes to replace one of the dies "by a surface of liquid, whether water or other fluid," confined in a close vessel having a piston moving within it, to which, power being applied, the water or other fluid will be forced against the intervening plate, and compress it into the die containing the required device, and thus obtain the impression thereof.

Fig. 20, Plate XIV., represents a vertical section of the apparatus which the Patentee employs to effect his object: *a, a,* is a strong frame of iron or other metal, at the lower part of which is formed a water chamber *b*; in this chamber is the piston *c,* which passes through a stuffing box at *d,* and is united at its upper end to the bed *d,* which has a cavity formed in its upper part for the reception of the die *e,* on the top of which is placed the sheet of metal *f,* on which the impression is intended to be formed; *g, g,* is a cylinder, securely bolted by flanges to the framing *a*; in this cylinder is formed the water chamber *h,* having an aperture with a conical orifice at the bottom, into which the piston *i,* passing through the stuffing box *k,* is received. The water is prevented from escaping from the chamber *h,* when the piston is up, by means of a thin diaphragm *l,* of Indian rubber, or other waterproof material, confined to the bed of the cylinder at its edges by means of metal rings: *m,* is the cylinder of an ordinary hydrostatic press; *n,* is the solid plunger or piston, worked by means of the lever and connecting links *o*; *p,* is a pipe, furnished with proper valves communicating the pump with the water chamber *h*; from the pipe *p,* extends the pipe *q,* communicating with the lower water chamber *b*; *r,* is the ram or monkey sliding between parallel guides, and capable of being elevated in order to descend violently upon the piston *i,* by means of a rope passing over a wheel on the platform, supported by the parallel guides.

The parts of the apparatus being situate as shown in the figure, with the plate of metal intended to be embossed in its cavity of the bed *d*, the pump is to be set in action, when the water or other fluid will be driven, by means of the pipes *p*, and *q*, into the chambers *b*, and *h*, and act on the pistons *c*, and *h**, with a sum of pressure in proportion to their respective areas, when the area of the piston *h*, being less than that of *c*, the latter will be driven upwards, and arrive in contact with the diaphragm *l*, which it will forcibly compress against the under side of the cylinder *g*; the pump continuing its operation, the pressure of the water will overcome the weight which rests upon the piston *h*, and drive it upwards, opening a communication for the pressure of the water upon the waterproof diaphragm *l*, and plate of metal *f*, which will both be compressed into the cavities of die *e*, containing the required device; the water pressure having been continued until the piston *h*, has arrived at the top of the chamber *i*, the pump is to cease working, and the monkey or ram drawn by means of its cord and wheel to the top of the parallel guides, and precipitated quickly on to the head of the piston *h*, when, there being but the thin flexible diaphragm *l*, between the water and the plate, the pressure will be communicated to the latter, which will be driven more sharply into the cavities of the die, and the required design perfected. The cock *r*, in the pipe *q*, is now to be opened for the discharge of the water, when the piston *i*, will first descend, and, by the fitting of its conical end into the seat at the bottom of the chamber *i*, prevent the pressure of the water from bursting the flexible diaphragm *l*, when the piston *c*, returns to its former position, which it will then do, and the embossed plate may be removed and another substituted to undergo a like operation. The piston *c*, is bolted to the bed *d*, in order that another bed of differently sized cavity may be applied to suit a change of design, and, consequently, die.

The Patentee observes, that the pump may be detached from the press and placed at any convenient distance, and that branch pipes, provided with proper valves, may communicate with one pump, in order to work several presses simultaneously.—[*Inrolled in the Inrolment Office, September*, 1836.]

To FRANCIS GYBBON SPILSBURY, *of Newman-street, Oxford-street, in the county of Middlesex, engineer, and* WILLIAM MAUGHAM, *of Newport-street, Lambeth, in the county of Surrey, chemist, for their invention of certain improvements in the manufacture of carbonate of soda.*—[Sealed 11th January, 1837.]

THE first part of these improvements applies to an apparatus to be used when muriate of soda is being converted into sulphate of soda, and the vapours arising therefrom conducted to condensing chambers for the purpose of arresting all their deleterious qualities. The Patentee states that, in the ordinary way of effecting this object, considerable loss is sustained by the manufacturer, in consequence of the water or other condensing medium cooling the smoke, and thereby materially reducing the draft of the chimney. To obviate this, it is proposed to furnish the flue or flues of the furnace with several small pipes, for the purpose of injecting steam in the required direction of the draft.

Fig. 21, Plate XIV., represents a section of the apparatus employed for this purpose: *a*, *a*, is the flue, provided with a metal plate, through which are orifices for the passage of the small steam pipes *b, b,* branching from the main pipe *c*. The Patentee states, that the vapours may be conducted to condensers of any form that may be desired, that which he claims as his invention under the head, being the introduction of steam into the flues of furnaces for the purpose of increasing the draft during the operation of converting muriate of soda into sulphate of soda, for the purpose of making carbonate of soda.

The second head consists in manufacturing carbonate of soda by converting muriate of soda into fluoride of sodeum, or fluosilicate of soda, instead of into sulphate of soda, as is the ordinary practice. This is accomplished by taking concentrated fluoric acid, obtained from the Derbyshire Spa, in the ordinary way, to which is to be added its own weight of muriate of soda, with sufficient water to prevent the muriatic acid from escaping in the form of gas; to this is to be added a sufficient quantity of flints, or other siliceous matter, to convert it into fluosilicate of soda. The supernatant liquor is then to be drawn off, which is concentrated muriatic acid, holding a little fluosilicate of soda in solution; the remaining fluosilicate is then to be heated with a red heat, to drive off what muriatic acid there may be hanging about it: about double of its weight of powdered chalk is now to be added, and the whole boiled in water for several hours. The effect of this is a double decomposition, whereby the fluosilicate of soda and carbonate of lime are converted into fluosilicate of lime, and carbonate and sesquicarbonate of soda. This supernatant liquor is then drawn off and the residuum well washed, and the wash added to the former liquor, and evaporated to dryness by a red heat, and pure carbonate of soda is the result, which may be again dissolved and crystallised in the usual manner. When it is desired to conduct the operation with fluoride of sodium, the process will be the same, with the exception of the siliceous matter. The claim on this head of the invention is the treating of muriate of soda with fluoric acid, in order to obtain carbonate of soda, instead of first obtaining sulphate of soda.—[*Inrolled in the Inrolment Office, July,* 1837.]

To JOHN SWINDELLS, *of Manchester, in the county palatine of Lancaster, manufacturing chemist, for his invention of certain improvements in the process of effecting the decomposition of muriate of soda or common salt.*— [Sealed 21st December, 1836.]

THESE improvements in effecting the decomposition of muriate of soda is principally intended to counteract and prevent the escape of the hydrochloric acid gas into the atmosphere as it arises during the ordinary process of decomposing muriate of soda in open reverberatory furnaces.

Presuming the usual manner of effecting the decomposition of muriate of soda or common salt to be generally understood, I have only to state the variation I propose as my improvement (and which I have found to answer with considerable effect), in order to comply with the object of these presents.

Having first prepared in convenient situations, closed vessels of stone or other suitable substances, and of any desirable capacity, charged with the materials usually employed in this process of decomposition; namely, the respective atomic proportions of muriate of soda and sulphuric acid, I effect the decomposition in the following manner. The closed vessels, containing the materials to be acted upon, are furnished with steam or hot-air pipes, which are suitably connected with ordinary steam-boilers or hot-air furnaces, and are also fitted with an internal agitator, in order to keep the whole of the materials in motion during the process of decomposition; the steam or heated air is now to be admitted into the interior of the vessels by opening the communication from the steam or hot-air generators, and allowed to fill the vessels, continuing the supply until the whole of the hydrochloric acid is expelled and conducted to the condensers through exit pipes, arranged in connexion with the decomposing vessels for that purpose.

Great advantages will be found to arise from this internal application of steam into the decomposing vessels; firstly, in the production of pure hydrochloric gas, being of course entirely free from the coal-gas and vapours arising from the usual process of decomposition; and secondly, in an effectual and ready method of propelling the hydrochloric gas through the water in the condensers; as it is in connexion with the steam, and blows off with it through the exit pipes arising from the top of the decomposing vessels.

This method which I propose of driving the hydrochloric acid gas with the exit steam through water, in order to obtain its condensation, will be found entirely to prevent the great nuisance of the admission of the hydrochloric acid gas into the atmosphere through the flues of the open reverberating furnaces in the common manner.

The sulphate of soda (the residuum which will be found in the decomposing vessels) is then to be run into a furnace, and dried down in the usual manner, and finished for use as heretofore.

I wish it to be perfectly understood, that I do not intend to claim any description or arrangement of apparatus by which my improvement is to be carried into practical effect, as the materials, dimensions, and construction of the same must necessarily be circumstantially arranged by the operator; but I do claim as my invention the application of steam or heated air into the decomposing vessels (whether open or closed), in order to effect the decomposition of muriate of soda.—[*Inrolled in the Rolls Chapel Office, June, 1837.*]

To THOMAS COCKRELL HOGAN, *of Castle-street, Holborn, in the county of Middlesex, light hat manufacturer, for his invention of certain improvements in hats, caps, and bonnets.*—[Sealed 29th March, 1836.]

THE improvements set forth by the Patentee in his specification, consist, firstly, in constructing the distending and supporting body, and which he denominates "the inner cap, hat, or bonnet," of horse hair, so as to form an elastic and flexible substratum, upon which an outer covering, called by the Patentee the outer hat, cap or bonnet, is applied; this outer covering being made of silk, cotton, beaver, Merton down, fur, or any other suitable substance that is commonly used for the exterior surface of caps, hats, and bonnets.

The second feature of the invention consists in applying and cementing the outer covering upon the supporting and distending substratum above described, by means of solutions of caoutchouc or India rubber, or through the medium of any other elastic cement which may be suitable for the purpose of uniting the outer covering to the inner one in such a manner as to form, when united together, an elastic cap, hat, or bonnet, capable of yielding to accidental external pressure, and of recovering its original shape when the pressure is removed.

The third improvement consists in using whalebone or whalefin, cut into hair-like filaments instead of horse hair, and in plaiting, weaving, or braiding the same with horse hair, threads, cotton, wool, flax, silk, or any other fibrous substance, to form a fabric that the supporting or distending body may be made from.

The fourth part of the invention consists in variously combining horse or other hair with threads of silk, flax, cotton, wool, or other vegetable fibrous substances; and also with whalebone, whalefin, willow, or any other tough and flexible woods, for the formation of a fabric from which the supporting substratum or inner hat, cap, or bonnet may be made.

The fifth head of the invention consists in forming a supporting substratum, by weaving, braiding, or plaiting of horse hair, or any other of the above-mentioned substances, singly or in combination, upon a block of the figure required; and, sixthly and lastly, in manufacturing an entire cap, hat, or bonnet of horse or other hair alone, or of horse or other hair in combination with threads of silk, wool, cotton, flax, or any other fibrous substance, upon a block of the figure required, by weaving, plaiting, and braiding.

After having described, under the several heads, in what his invention consists, the Patentee proceeds to describe the best means, with which he is acquainted, of carrying the same into effect; and he states that, in the first, third, and fourth heads, he considers it best to weave the fabric in sheets of the best long horse hair, both in the warp and weft, as this method affords the greatest degree of elasticity for a given weight of material used. Sometimes, however, the fabric which is woven, plaited, braided, or otherwise manufactured from a combination or intermixture of horse hair and threads of silk, or of worsted and horse hair, or of cotton or flax and horse hair, is manufactured in sheets in pieces, the above-mentioned materials being used alternately both in warp and weft. These sheets or pieces, that are manufactured from a combination and intermixture of different substances, may be made and mixed in such a manner and position as fancy or taste may dictate.

The Patentee states that, sometimes he makes the fabric of thin silk, of woollen, stuff, linen, cotton, or of felted cloth; and he combines with it, by sewing, cementing, or otherwise, a sufficient quantity of horse or other hair, or any other elastic filaments, for the purpose of obtaining the degree of elasticity that is required in the fabric. In forming the supporting or distending substratum from any of the above-mentioned substances, it must be obvious to every one, that various methods of cutting out and putting together must be adopted according to the shape of the hat, cap, or bonnet that is intended to be made, as the fashions are continually changing; or according to the quality, as respects ventilation, lightness, flexibility, or any other nature that may be required.

Any competent hatter will readily understand the manner of proceeding in manufacturing a man's hat of the ordinary appearance, by a description of one mode, and which put the manufacturer into possession of all the means that are employed to adapt the articles to the prevailing fashion or to convenience. In forming the supporting substratum or distending body of the ordinary kind of hat, a circular or oval piece, as fashion may require, is cut out from a sheet of one of the above described fabrics, which is intended for the upper or flat part of the crown; a piece of ribbon, tape, or strip of linen or cotton cloth is then cemented round the edge with a solution of India rubber, so as to form a selvage, for the purpose of sewing or otherwise connecting the crown to the cylindrical part or body of the hat. Then the side piece is cut of the length of about two or three inches more than the circumference of the crown, and of about an equal width with the crown; a strip of tape, ribbon, linen, or cotton cloth, is also cemented on to the top and bottom sides of this piece, for the purpose of connecting at top with the crown, and at the bottom with the brim; in all the junctions about the hat, an elastic and waterproof material, such as a solution of caoutchouc, must be used. The long side piece is now formed into a cylinder, and, as the length of the side piece is longer than the circumference of the crown, the ends will overlap, and may be cemented together with the above-named elastic cement; and in order to give strength to the junction, a piece of muslin gauze is sometimes placed down it, so as to hold it all perfectly secure and tight. The brim of the inner hat is made of one or more thicknesses of any of the above described fabrics, and one or more layers of linen or cotton cloth, or thin felt, or other suitable material, and the same is moulded upon a block of the figure required; the inner and outer edges of the brim being also covered with ribbon or tape, cemented on to them, for the purpose of forming selvages, in the same manner as is done with respect to the side and crown pieces; the whole is then fixed on to a block, to support the body in the proper figure. If it be required to make the brim firm, and the crown only elastic, then the brim is constructed in the usual way, and it is united with the crown, that is, made according to this invention.

The supporting substratum or distending body being completed, and an outer covering of silk, cotton, Merton down, or any other suitable article that is used, in place of beaver, having previously been cut out and sewed together in the ordinary manner, and of the proper dimensions; the workman must then take a brush, and lay on with it a coat of the solution of caoutchouc on to the crown of the inner hat, cap, or bonnet, and immediately apply the inner cap or hat with this solution to the inside of the crown of the outer hat or covering, the outer hat being turned inside out for the purpose of more conveniently attaching it to the supporting substratum or inner hat. The flat part of the crown of the hat being heated in the manner above described, the workman then lays on a coat of the elastic solution round the cylindrical part of the crown; but it must be observed, that the whole of the cylindrical part is not done at once, but only a portion or band all round has the solution laid on; the outer hat or covering is then brought down over that part of the substratum that is so treated; after which, another portion of the body has the solution laid on, and the covering is then brought down over that, in regular succession, until the whole of the body is completely cemented to the outer covering. After this is done, a bandage is wound round the cylindrical part of the hat, to keep the outer hat or covering in contact with the inner, so that they may be firmly cemented together; the hats being all placed on a flat table, on their crowns, to keep the flat parts of the crown in contact with each other, where they are allowed to remain for an hour or more, according to the drying quality of the solution used.

When the body of the hat is dry, the brims of the outer and inner hats are cemented together, and also a piece of the outer substance on the underside of the brim, and, when the whole is perfectly dry, the hat is finished off in the usual manner; according to the skill and judgment of the workman in the heating and using of his irons, card brush, and any other of the implements that are in ordinary use. If elastic cements that are rendered adhesive by heat are used, such, for instance, as oil, varnish, or any other cementing material that may be made of slowly drying compounds, the varnish or other cement is laid on the inner hat, and allowed to dry, and the adhesion is produced by the application of a hot iron in the ordinary manner, when the two hats are placed, the one over the other.

In carrying the fifth part of the improvement into effect upon a hat of the ordinary size and figure, the Patentee informs us that he takes horse-hair, of about three quarters of a yard or more in length, and a sufficient number of them are placed in a loom to form a warp of about seven inches in width; he then commences introducing the woof or weft, which consists also of hairs of three quarters of a yard or more in length, the commencement of the work being about three inches and a half from the middle of the length of the warp; at first weaving together only a few of the middle hairs of the warp along with the middle part of the hairs of the woof or weft, and leaving the ends of the weft hanging down equi-distant on each side of the warp. In proportion as the woof increases in quantity, so is a greater width of the warp included and woven in with it, and the gradual increase is so managed, that when three inches and one half of the weft is woven in the texture or fabric, or part of the warp or weft so woven together shall present the form of a semi-circle of three inches and one half radius, the remaining three and a half inches of the weft, in the width of its union with the warp, must then be decreased in the same proportion as the first half was increased; so that when seven inches of the weft is interwoven with the warp, the texture of that part that is woven shall present a complete circle of seven inches in diameter in the middle of the length of the hairs, leaving the remaining parts of the hairs unconnected with each other, but projecting nearly equi-distant from the circumference of the circular texture. In the formation of a hat-body, a piece of fabric, woven in the manner just described, must be taken, and the circular part laid upon a hat-block of its own diameter; a disc of wood or metal of the same diameter is then nailed down upon the block, with nails so fine and pointed, as not to injure the woven texture of the horse-hair; the loose hairs are then plaited or braided together all round the cylindrical part of the hat-block, after which a bandage is placed all round the lower part of the plaited hair, and the whole is then placed on a brim-block. The remaining ends of the hairs must then be plaited in such a manner as to make them lay upon the block and form the brim of the body, and then a piece of ribbon, tape, or such other material, is cemented all round the said brim.

Sometimes, however, instead of plaiting the hairs together over the cylindrical surface of the block, they are laid along the cylinder that is parallel to the axis, and they are woven together with a weft of silk or other thread that is passed around the cylinder in a spiral course; and when the thread arrives at the brim, the hairs are laid in a direction radiating from the axis, and the working in of the weft is continued in a diverging spiral course to the extremity of the brim, and a ribbon or tape is cemented round the extremity of the brim in the manner before described. The supporting substratum or body of the hat being thus constructed, it is to be covered with the outer hat in the same man-mer as that described for the bodies that are cut out of woven or plaited sheets or pieces, and sewn together. The Patentee here states, that he sometimes makes an entire hat, cap, or bonnet, in the manner just described, on a block, and which is woven without any covering or outer hat, and is only finished off with a binding of ribbon or tape around the edge or extremity of the brim. In conclusion, the Patentee states, that he lays no claim to the use of horse-hair, silk, woollen, linen, or cotton, thread, filaments of whalebone, whalefin, or wood, or of any of their combinations for constructing the outer casing or conspicuous surface of a hat, cap, bonnet, &c., except in the case of horse-hair, woven, plaited, or braided, according to the manner of the sixth part of the invention above described; but he limits his claim to the combining of the elastic properties of horse or other hair, with threads of silk, wool, cotton, linen, or with filaments of whalebone, whalefin, or of willow, or other tough woods, as hereinbefore described, for the purpose of manufacturing a body to support or distend an outer texture or fabric of silk, cotton, beaver, Merton down, or other suitable substances which present the appearance of a beaver nap, or of plush, shag, fur, or velvet, and also for cementing any of the same upon the elastic supporting substances or distending body, by means of common elastic solutions, such as caoutchouc or other elastic cements, by which means a hat, cap, or bonnet, is produced capable of yielding to accidental pressure from without, and of recovering its original figure by its own elasticity when the pressure is taken way; and the Patentee further states, that he claims all the varieties of the manner of producing this effect, and which fairly and naturally belongs to, and arise from, the different constructions hereinbefore described. He also states, that he lays claim to the use of the sixth parts of the above described improvement, in which the construction of a hat, cap, or bonnet, the horse-hair and threads shall constitute the outer surface or most conspicuous part of the hat, cap, or bonnet, and which is not covered by any of the above mentioned substances, textures, or fabrics.—[*Inrolled in the Inrolment Office, September,* 1836.]

SCIENTIFIC NOTICES.

ACT OF CONGRESS OF THE UNITED STATES OF AMERICA, RESPECTING THE LATE CALAMITOUS CONFLAGRATION OF THE PATENT OFFICE, WASHINGTON, ON THE 15TH DECEMBER, 1836.

FOR the information of our American friends, residing in Great Britain, and on the Continent, we give the following epitome of the Act of Congress, passed in the United States, for the purpose of restoring, to the fullest extent possible, the specifications, models, drawings, &c., lost at the late fire in the Patent Office, Washington; and, we cannot but congratulate our American readers on the prompt and efficient manner in which Congress has done its utmost to restore this great (and we fear irreparable) national loss; and, we cannot allow this opportunity to pass without a glance, not at our *Patent Office,* because we have none, but at the three several buildings or offices in which our specifications and drawings are deposited, and the method of keeping the same in safe custody. One of them has certainly an advantage over the others (*i. e.*), the Rolls Chapel, in which we know neither fire or candle is ever allowed to enter; in the other two, there is not the same restrictions, and the late fire in America only further shows the propriety of keeping these public records in one fire-proof and safe building.

"*An Act in addition to the late Act, to promote the progress of science and useful arts.*"—Be it enacted by the Senate and House of Representatives of the United States of America, in Congress assembled, that any person in possession of, or in any way interested in, any patent for an invention, &c., issued prior to the 15th of December, 1836, may, without charge, on transmission thereof to the Commissioner of Patents, have the same recorded anew in the Patent Office, together with the descriptions, specifications, &c. belonging thereto; and, it shall be the duty of the Commissioner to cause the same, or any authenticated copy of the original record, specification, or drawing which he may attain, to be transcribed and copied into books of record; and wherever a drawing was not originally annexed to the patent, and referred to in the specification, any drawing produced as a delineation of the invention, being verified by oath in such manner as the Commissioner shall require, may be transmitted and placed on record, as aforesaid, accompanied by the certificate of the oath; or such drawings may be made in the office, under the direction of the Commissioner, in conformity with the specification. And it is the duty of the Commissioner to take such measures as may be determined by the Board of Commissioners under the fourth section of this act, to obtain the patents, specifications, &c., for the purpose of being so recorded; and it shall be the duty of the judicial courts of the United States, to transmit to the Commissioner of the Patent Office, a statement of all the authenticated copies of patents, specifications, and drawings, made and executed prior to the 15th day of December, which may be on the files of his office; and, also to make out and transmit to said Commissioner, for record, a certified copy of every such patent, specification, or drawing, which shall be required by said Commissioner.

Section 2. And be it further enacted, that copies of such record and drawings, certified by the Commissioner, or by the Chief Clerk, shall be *prima facie* evidence of the particulars of the invention and of the patent granted therefore, in any judicial court of the United States, in all cases where copies of the original record, or specification, and drawings, would be evidence, without proof, of the loss of such originals; and no patent issued prior to the aforesaid 15th day of December, shall, after the 1st day of June next, be received in evidence in any of the said courts, in behalf of the

Patentee, or other person in possession of the same, unless it shall have been so recorded anew, and a drawing of the invention, if separate from the patent, verified as aforesaid; nor shall any written assignment of any such patent, executed and recorded prior to the said 15th day of December, be received in evidence in any of the said courts, in behalf of the assignee or other person in possession thereof, until it shall have been so recorded anew.

Section 3. And be it further enacted, that whenever it shall appear to the Commissioner that any patent was destroyed by the burning of the Patent Office on the aforesaid 15th day of December, or was otherwise lost prior thereto, it shall be his duty, on application therefore by the Patentee or other person interested therein, to issue a new patent for the same invention or discovery, bearing the date of the original patent, with his certificate thereon, that it was made and issued pursuant to the provisions of the third section of this act, and shall enter the same on record. Provided, however, that before such patent shall be issued, the applicant therefore shall deposit in the Patent Office a duplicate, as near as may be, of the original model, drawing, and description, with specification, of the invention or discovery, verified by oath, as required by the Commissioner; and such patent and copies of such drawings duly certified, shall be admissible as evidence in any judicial court of the United States, and shall protect the rights of the Patentee, his administrators, heirs, and assigns, to the extent only in which they would have been protected by the original patent and specification.

(To be continued.)

NEW METHOD OF PREPARING SKINS.

Mr. Willshire has sent to the Zoological Society of London, a description of the method used in Morocco for preparing skins. The method proposed is excellent for preserving the colour of the fur, and giving flexibility to the skins. The manner in which they are prepared is as follows:—The skins are first washed in cold fresh water, and all fleshy particles are removed; then two pounds, by weight, of alum, two pints of butter milk, and two or three handsful of barley meal, are mixed together, and the mixture is put into the interior of the skin, which is spread out for that purpose. The skin is then folded up and pressed with care, and left in this manner for the space of two days; on the third it is washed in salt or sea water, and then hung up to drain; after which, a coat or layer of pounded rock alum is laid on the inside of the skin, which is folded up as before. The skin is then left in this state for two or three days; at the end of which time it is dried by the heat of the sun; and, when it is dry, it is damped with one or two pints of water, and then re-folded again, and left to imbibe the water for the space of two hours, after which it is spread upon a table and rubbed pretty briskly with a flint, until it becomes soft and supple.—*Recueil Industriel.*

METHOD OF CONSTRUCTING FLOATING BRIDGES WITHOUT ANCHORS.

A method of carrying this into execution has been invented by a State Councillor of Witbesk, in Lithuania, of the name of Humbenthal. The bridge has the form of an obtuse angle, which, when placed against the current, gives the necessary firmness. The inventor is, at the present time, constructing a dike for a mill in this manner. According to his plan, a single wall, placed at an obtuse angle, and composed of beams, placed one on the top of the other, will resist the current of the most rapid river. We doubt, however, the possibility of putting this plan into execution; but, if it succeeds, it will doubtless reduce the expense of such constructions, and will find plenty of imitators.—*Ibid.*

LITERARY NOTICE.

Steam Communication with India by the Red Sea, advocated in a Letter to the Right Honourable Lord Viscount Melbourne, illustrated by plans of the route and charts of the principal station. By Dionysius Lardner, LL.D., F.R.S. One vol. 8vo., pp. 124, with Maps. Published by Allen and Co., Leadenhall-street, and Hatchard and Son, Piccadilly.

It is with great pleasure we recommend, for the perusal of our readers, the above work; the cause which it advocates is, in itself, sufficient to call the attention of all those interested in the welfare of this great commercial nation, and its individual merits will amply compensate the reader for his perusal of it. No one can deny the immense advantages, both commercial and social, to be derived from a rapid communication with our territories in India; and the author of the work before us has not only proved that this may be accomplished, with ease and safety, in almost one-third of the usual time, but, if properly conducted, in all probability, with pecuniary advantage to the Government. Not only is the tract arranged, provision made to overcome local difficulties, and the positions pointed out for depots that will lead to the effective operation of the voyage, but reasoning from analogy, in the practical working of steam ships now in actual service, the author has calculated the expense requisite to support the line of communication, and, after making most liberal allowances for contingencies, points out to the most sceptical the advantageous terms on which this great, and anxiously-looked-for project may be carried into effect. Should there be any of the present age who prefer travelling through a course of 16,000 miles to gain a position only 6000 miles distant, we advise them to read the above publication of Dr. Lardner.

List of Patents

Granted in Scotland between 22*nd June and* 22*nd July,* 1837.

To Alexander Macewan, grocer and tea-merchant, in Glasgow, for an invention of a process for the improvement of teas as ordinarily imported.—26th June.

— James Leonard Clement Thomas, of Covent Garden, in the county of Middlesex, esq., in consequence of a communication made to him by a certain foreigner residing abroad, for an invention of an improvement applicable to steam-engines and steam generators, having for its object economy of fuel.—7th July.

To John Spurgin, of Guildford-street, Russell-square, in the county of Middlesex, doctor of medicine, for an invention of an improvement or improvements in the mode or means of propelling vessels through the water, and part of which means may be applied to other useful purposes.—14th July.

— George Nelson, of Leamington Priors, in the county of Warwick, gentleman, for an invention for a certain new or improved process or processes by the use of which the qualities of a certain gelatinous substance, or certain gelatinous substances, called isinglass, may be improved.—18th July.

— Thomas Lutwyche, of Liverpool, in the county of Lancaster, manufacturing chemist, for an invention of certain improvements in the construction of apparatus used in the decomposition of common salt, and in the mode or method of working or using the same.—20th July.

— William Bell, of Edinburgh, in the kingdom of Scotland, esq., for an invention of improvements in heating and evaporating fluids.—21st July.

— James Dredge, of the parish of Walcot, in the city of Bath and county of Somerset, brewer, for an invention of certain improvements in the construction of suspension chains for bridges, viaducts, aqueducts, and other purposes, and in the construction of such bridges, viaducts, or aqueducts.—22nd July.

New Patents
SEALED IN ENGLAND,
July, 1837.

To Henry Augustus Wells, late of the city of New York, but now residing in Threadneedle-street, in the city of London, hat manufacturer, for his invention of certain improvements in the manufacture of hats.—Sealed 30th June—6 months for inrolment.

To Freeman Roe, of Camberwell, in the county of

Surrey, plumber; for his invention of an improvement in water closets.—Sealed 7th July—6 months for inrolment.

To John James Waterstone, of Millbank-street, Westminster, in the county of Middlesex, surveyor, for his invention of improvements applicable to the intercepting and directing of currents and waves of water.—Sealed 10th July—6 months for inrolment.

To William Pringle Green, of Falmouth, in the county of Cornwall, lieutenant in the Royal Navy, for his invention of improvements in capstans and machinery employed in raising, lowering, and moving ponderous bodies and matters.—Sealed 10th July—6 months for inrolment.

To William Chubb, of Portsea, in the county of Hants, umbrella manufacturer, for his invention of improvements in night commode pans.—Sealed 10th July—6 months for inrolment.

To Thomas North, of Mitre-street, New-cut, in the county of Surrey, card, paper, and metal piercer, for his invention of an improvement in the manufacture of wire.—Sealed 19th July—6 months for inrolment.

To Whitmore Baker, of Dedham, in the county of Essex, veterinary surgeon, for his invention of an instrument or truss applicable to the nicking of horses' tails.—Sealed 19th July—6 months for inrolment.

To John Pearse, of Tavistock, in the county of Devon, ironmonger, for his invention of an improvement or improvements in the construction of wheels.—Sealed 19th July—6 months for inrolment.

To John Hartley Hitchin, and Robert Oram, of Salford, in the county of Lancaster, engineers, for their invention of certain improvements in the construction and arrangement of cranes for lifting and removing goods, by which such machines are rendered more generally useful.—Sealed 19th July—6 months for inrolment.

To John Poad Drake, of Arundel-street, Strand, in the county of Middlesex, artist, for his invention of improvements in building ships, steam vessels, and boats, and also in the building of canal and river barges, and lighters.—Sealed 19th July—6 months for inrolment.

To Sir James Caleb Anderson, of Buttevant-castle, in the county of Cork, baronet, for his invention of certain improvements in locomotive-engines, which are partly applicable to other purposes.—Sealed 19th July —6 months for inrolment.

To Henry Goschen, of Crosby-square, Bishopsgate-street, in the city of London, merchant, for his invention of improvements in preparing flax and hemp for spinning, being a communication from a foreigner residing abroad.—Sealed 19th July—6 months for inrolment.

To Joseph Henry Tuck, of the Rainbow Coffee-house, in the parish of St. Magnus, in the city of London, gentleman, for his invention of certain improvements in apparatus or machinery for making or manufacturing candles.—Sealed 25th July—6 months for inrolment.

To John Melling, of Liverpool, in the county of Lancaster, engineer, for his invention of certain improvements in locomotive steam-engines to be used upon railways, parts of which improvements are applicable to stationary steam-engines, and to machinery in general.—Sealed 26th July—6 months for inrolment.

CELESTIAL PHENOMENA, FOR AUGUST, 1837.

D.	H.	M.	
1			Clock before the ☉ 5m. 59s.
	—		☽ rises 3h. 43m. M.
	—		☽ passes mer. 0h. 11m. A.
	—		☽ sets 8h. 23m. A.
	8	8	☿ in conj. with the ☽ diff. of dec. 3. 9. S.
		20	Ecliptic conj. or ● new moon.
	14		☽ in Apogee.
2	5	29	♃ in conj. with the ☽ diff. of dec. 3. 49. S.
	20	2	♀ in conj. with the ☽ diff. of dec. 2. 48. S.
	22	6	♄ in □ with the ☉
5			Clock before the ☉ 5m. 41s.
	—		☽ rises 8h. 29m. M.
	—		☽ passes mer. 3h. 0m. A.
	—		☽ sets 9h. 15m. A.
	21	13	♂ in conj. with the ☽ diff. of dec. 1. 27. S.
7	9	9	☿ in conj. with ♃ diff. of dec. 0. 48. N.
8	17	8	♄ in conj. with the ☽ diff. of dec. 3. 57. N.
9	1	22	☽ in □ or first quarter.
10			Clock before the ☉ 5m. 4s.
	—		☽ rises 2h. 52m. A.
	—		☽ passes mer. 6h. 45m. A.
	—		☽ sets 10h. 31m. A.
13			Occul. (84) Sagitt., im. 7h. 0m., em. 7h. 44m.
14			Occul. (170) Capri., im. 7h. 55m., em. 8h. 59m.
15			Occul. (243) Capri, im. 11h. 37m., em. 12h. 42m.
	—		Clock before the ☉ 4m. 13s.
	—		☽ rises 7h. 41m. A.
	—		☽ passes mer. 11h. 57m. A.
	—		☽ sets 2h. 48m. M.
	13		☽ in Perigee.
16	5	39	Ecliptic opp. or ○ full moon.
	13	42	♅ in conj. with the ☽ diff. of dec. 3. 13. N.
17			Mer. R. A. 10h. 56m. dec. 7. 37. N.
	—		Ven. R. A. 11h. 21m. dec. 5. 34. N.

D.	H.	M.	
17			Mars R. A. 12h. 54m. dec. 5. 39. S.
	—		Vesta R. A. 23h. 23m. dec. 14. 13. S.
	—		Juno R. A. 13h. 51m. dec. 1. 31. S.
	—		Pallas R. A. 2h. 23m. dec. 2. 53. S.
	—		Ceres R. A. 4h. 50m. dec. 17. 44. N.
	—		Jupiter R. A. 10h. 1m. dec. 13. 2. N.
	—		Saturn R. A. 14h. 39m. dec. 13. 9. S.
	—		Georg. R. A. 22h. 36m. dec. 9. 41. S.
	—		☿ passes mer. 1h. 31m.
	—		♀ passes mer. 1h. 38m.
	—		♂ passes mer. 3h. 11m.
	—		♃ passes mer. 0h. 18m.
18			Occul. 10 Ceti, im. 9h. 58m., em. 10h. 58m.
20			Clock before the ☉ 3m. 9s.
	—		☽ rises 8h. 57m. A.
	—		☽ passes mer. 3h. 24m. M.
	—		☽ sets 10h. 24m. M.
21			Occul. δ Arietes, im. 16h. 19m., em. 17h. 29m.
	17	57	♃ in conj. with the ☉
22	18	54	☿ in the descending node.
	—		Occul. 32 Tauri, im. 11h. 45m., em. 12h. 27m.
23	1	16	☽ in □ or last quarter.
24	10	7	♂ in the descending node.
	—		Occul. C Tauri, im. 15h. 20m., em. 16h. 13m.
25			Clock before the ☉ 1m. 53s.
	—		☽ rises 11h. 23m. A.
	—		☽ passes mer. 7h. 37m. M.
	—		☽ sets 4h. 43m. A.
28	17		☽ in Apogee.
29	15	50	♅ in opp. to the ☉
	23	42	♃ in conj. with the ☽ diff. of dec. 3. 31. S.
31	4		Ecliptic conj. or ● new moon.

The Satellites of Jupiter are not visible this month, Jupiter being too near the Sun.

J. LEWTHWAITE, Rotherhithe.

METEOROLOGICAL JOURNAL,

FOR JUNE AND JULY, 1837.

1837.	Thermo.		Barometer.		Rain in inches.	1837.	Thermo.		Barometer.		Rain in inches.
	Hig.	Low.	High.	Low.			Hig.	Low.	High.	Low.	
June						July					
26	71	46	30,15	30,10		11	73	37	29,90	Staty.	
27	68	36	30,14	30,12		12	65	46	29,90	29,85	
28	71	32	30,11	Staty.		13	73	39	29,78	29,75	
29	77	32	30,07	30,03		14	75	47	29,76	29,72	
30	75	48	30,17	30,03		15	74	47	29,81	Staty.	,03
July						16	67	41	29,93	29,86	,4
1	67	35	30,24	Staty.		17	73	40	29,93	29,90	,075
2	75	30	30,22	30,17		18	69	47	29,82	29,77	,1
3	75	36	30,16	30,08		19	74	47	29,77	29,74	
4	74	41	30,07	Staty.		20	67	46	29,84	29,78	
5	74	40	30,09	30,05		21	69	42	29,98	29,92	,075
6	74	49	30,09	30,05		22	75	40	29,98	Staty.	
7	73	42	30,13	Staty.		23	74	40	29,97	29,95	
8	79	45	30,10	30,08		24	73	45	30,05	30,01	
9	66	37	30,08	30,00		25	75	46	30,02	Staty.	
10	74	35	29,93	29,89							

Edmonton. CHARLES HENRY ADAMS.

Latitude 51° 37 32 N.
Longitude 3 51 West of Greenwich.

THE
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CONJOINED SERIES.

No. LXVI.

Recent Patents.

To Miles Berry, *of the Office for Patents,* 66, *Chancery-lane, in the parish of St. Andrew, in the county of Middlesex, mechanical draftsman and patent-agent, for an improvement or improvements in the making or constructing of gas meters, communicated to him by a foreigner.*—[Sealed 19th March, 1833.]

This invention of an improvement or improvements in the making or constructing of gas meters, consists of a novel kind of apparatus or instrument for measuring and registering the quantity of gas passed through the same from the gas main or street pipe to the burner; and is of that class or description of gas meters commonly called "dry meters," that is, in which there is not any water or other liquid used to retain or retard the escape of the gas through the meter, and to cause its expansive force to work or set in motion the apparatus, as in meters of the rotary or common construction. Dry gas meters have been made before, but have failed in their desired effect, from the friction and complication of the parts of the apparatus. One of the desired features of this invention is, that it shall work with as little friction as possible, so that the least possible opposition shall be offered to the gas as it passes through the meter; so that gas, at a very low pressure, shall be capable of passing through it, and, at the same time, the quantity of cubic feet shall be measured and registered correctly. This improved construction of meter is formed as a hollow chamber or vessel, perfectly air-tight of itself, and divided or separated into two portions or chambers, by a moveable and flexible partition or diaphragm, that is, the partition is connected by a flexible medium, placed around its edges, to the chamber, so that the partition will be allowed to vibrate or move from one side of the chamber towards the other, and yet form a gas-tight partition between the two sides or chambers; one of these portions or chambers is constantly open to the supply pipe from the gas main, and the other open to the gas burners. The vibratory movements of this partition or diaphragm are registered by a pall and ratchet wheels, with a train of gear wheels, dials, and indexes, similar to those used in gas meters of the common construction; and at the time the diaphragm or partition vibrates, and has arrived at the extent of its motion, it is made, by means of a lever and spring, to open and shut, or change instantaneously the apertures or ways in the cock which connect the gas pipes with the meter and burner. The cock has four ways or passages through it, two of which lead from the gas pipe or main, and the other two are individually connected to the two portions or chambers. As many different variations may be made in the form and arrangement of the parts of this improved construction of gas meters, two different forms of meters are shown, one having the works inside of the casing or chamber, and the other on the outside.

Fig. 1, in Plate XVI., is a front view of one of these improved gas meters, the dial, with its indexes, and part of the train of gear, being removed in order to show the pall and ratchet wheel, which communicates the motions from the flexible partition or diaphragm to the registering indexes on the dial. Fig. 2, is a vertical section, taken through the meter, showing the partition or diaphragm at its extent of motion; and the cocks, springs, and levers, in the position they would be immediately before the change of the passages of the cock is effected. Fig. 3, is a section taken horizontally through the same; fig. 4, is another similar section to fig. 2, showing the flexible partition or diaphragm at its extent of motion on the opposite side to that in fig. 1, the same letters being used to denote similar parts in all these and the following figures: *a, a, a,* is the case or vessel, divided into two portions or chambers A, and B, by the flexible partition or diaphragm *b,* which is mounted to turn on a hinge joint at *c,* near the bottom of the case. The case or vessel is, in this instance, represented as of an egg-like figure, and may be made of cast iron or other metal or material in two parts, and joined together by flanges and screws, with the edges of the flexible partition or diaphragm placed between them, and a slight packing of leather may also be used to render the joint air-tight: *d,* is the pipe leading from the street pipe or gas main, and *e,* the pipe leading from the meter to the burner; *f,* is the four-way cock; *g,* is a spring, coiled round the end of the plug of the cock, which throws or changes the ways of the cock, and alters the passages for the gas into and from the meter:

h, and *i*, are two levers, fixed on to the other end of the plug of the cock; *k*, is a projecting arm, fixed on to the partition *b*, which acts alternately in conjunction with the levers *h*, and *i*, the lever *h*, acting against the under, and the lever *i*, acting against the upper, surface; *l*, is another arm, projecting from the partition, having a pin on its end, which works in the slot formed by the double end of the coiled spring *g*; *m*, is a short lever, fixed on to the partition near the hinge joint, and which communicates the movements of the partition through the pall or lever *n*, to the ratchet wheel *o*, and that through the train of toothed wheels to the dial and indexes; *p*, and *q*, are two apertures or pipes, opening into the two chambers A, and B, for the escape of the gas from the chambers to the burners.

Figs. 9, and 10, represent two sections taken through the cock, for the purpose of showing the ways or passages. Fig. 9, represents the ways of the cock in the position they would be as at fig. 2, that is, with the passage to the burner open for the escape of the gas from the portion or chamber B, the gas being then in the act of escaping to the burner in the direction of the arrow, through the aperture or end of the pipe at *p*, and up that pipe and through the plug of the cock *f*, and pipe *e*, to the burner. As the gas is consumed from the chamber B, the other chamber A, is filled from the gas main or street pipe, through the pipe *d*, and cock, in the direction of the arrow, and entering the chamber at the aperture *q*, the expansive force of the gas being disseminated over the whole surface of the flexible partition or diaphragm, will cause it to vibrate or move from one side of the chamber towards the other, and bring it, with the levers, springs, and arms, into the position shown in fig. 2, that is, with the bent arm of the lever *h*, pressing upwards upon the under surface of the arm *k*;

at the same time, the pin, on the end of the arm *l*, acting in the slot on the end of the spring *g*, has forced the spring to uncoil in a slight degree; but the spring is prevented from turning or shifting the plug, by the bent end of the lever *h*, pressing upon the under side of the arm *k*; but the moment the bent end of the lever *h*, has passed the end of the arm *k*, the spring *g*, is free to recoil, and its tension throws or shifts the plug of the cock instantaneously into the position shown in the two side views, figs. 5, and 6, and in the section figure 10, thereby instantaneously cutting off the connexion of the chamber B, with the burner, and opening a communication with it and the gas main, and, at the same time, forming a communication from the chamber A, to the burner, the gas will then immediately begin to escape from the chamber A, through the aperture *q*, and through the cock *f*, and pipe *e*, to the burner; and, when the proper quantity of gas has been consumed, the pressure from the main will have brought the flexible partition into the position shown in fig. 4; then the pin, on the arm *l*, will have forced the spring to be coiled somewhat tighter than when it is out of tension, which will cause the bent end of the lever *i*, to rest upon the upper part of the arm *k*, as shown in fig. 4; and as soon as the bent end of the lever *i*, has passed the end of the arm *k*, or the bent part nearest the partition, the spring will be again free to throw or shift the cock back again into its former position, as shown in the the two side views, figs. 7, 8, and 9, and so on. It will be, therefore, seen that the length of the arm *k*, or the extent which the ends of the two levers *h*, and *i*, travel on its upper and under side, will determine the extent of vibration or movement of the partition, and the quantity of gas consumed between the extreme points of such movement or vibration, will be the quantity measured and registered by the indices and dial, the lever *m*, and the pall *n*, only moving the ratchet wheel, one tooth during two vibrations. It will be evident that the space or extent of vibration of the flexible partition may be adjusted to measure any quantity required to be registered, and that gas of any pressure may be passed rapidly through the meter, the gas having no way of escaping but through the cock; and all that passes through it must be measured: *r*, is a small cup or reservoir, screwed air-tight upon the end of the pipe *p*, which projects through the case, and is there placed for the purpose of receiving any acid refuse or other extraneous matter which may escape from the gas main, and is intended to prevent its getting into the meter: this cup may be removed and emptied from time to time, as required.

The several figs., 19, to 24, are representations of another of these improved gas meters, of a different form to that shown at figs. 1, 2, 3, and 4, in which the working parts, or mechanism for registering the quantity of gas consumed, and for changing the ways or passages of the cock, is placed on the outside of the case or vessel, and is of a somewhat different arrangement, though similar in effect, to that shown in figs. 1, 2, 3, and 4; and, for the convenience of reference, I have used the same letters to denote similar or corresponding parts, as in the former figures.

Fig. 19, is a side elevation; fig. 20, is a representation of the front end of the meter; fig. 21, is a vertical section; and fig. 22, is a plan view of the same, the moving parts being shown in the same situation as in figs. 2, and 3: *a*, is the case; *b*, the flexible partition, which turns upon a hinge joint *e*; the pin or axis of the joint is fixed to the partition, and works at one end in a small bearing on the inside of the back end of the case; the other end projects through a small stuffing box on the front end of the case, and has a pall *m*, fixed on its extremity, which communicates the motion of the flexible partition to the ratchet wheel *o*, and indices; *d*, is the pipe leading from the main; *e*, the one leading to the burner; *p*, is the pipe leading to and from the chamber B; *q*, is a similar pipe, belonging to the chamber A: *f*, is the four-way cock. In this gas meter, there is but one lever *h*, fixed upon the end of the plug of the cock, and the spring *g*, is made of a straight form; *l*, is a long lever, which is fixed on to the end of the axis *c*, of the partition, and extends upwards between the two service pipes *p*, and *q*; the upper end of this lever is connected by a small chain *s*, to the end of the spring *g*; and as the expansive force of the gas moves the flexible partition from one side to the other, the lever *l*, by means of the chain *s*, and spring *g*, will alternately bring the lever *h*, in contact with the pins *t*, and *u*, on the short arms of the lever *l*, as shown in figs. 20, and 21.

Fig. 20, shows the lever *h*, and spring, in the position they are just before the diaphragm arrives at the end of its vibration; when it has done so, the end of the lever *h*, slips off the pin *t*, and the spring *g*, will be released, and immediately throw the lever into the position shown by dots in fig. 20, when the passages of the cock will be changed, and the connexion between the chambers and gas pipes reversed, when the expansive force of the gas will cause the flexible partition to return into the situation shown in figs. 25, and 26.

Fig. 23, is another end elevation, showing the parts in reverse position to fig. 20. Fig. 24, is a section taken through the same; and after the end of the lever *h*, has shifted off from the pin *u*, the spring will throw the lever into the position shown by dots in fig. 23, and then the force of the gas will move the lever into the position shown in fig. 20, and so on: *v*, *v*, are small pipes, extending downwards through the case, with plugs on their ends; and are intended for the same purpose as the cups or reservoirs in figs. 1, 2, 3, and 4.

As there are many different kinds of cocks or valves which may be employed in the improved gas meter with good effect, it will not be necessary for me to describe all the varieties; but I have shown several other figures of different sorts of cocks, which may be used with advantage. Fig. 11, is a section taken through a cock of the same description as figs. 9, and 10, but which is more simple in its construction, the plug *f*, having only a partition extending across it to form the two ways or openings. Figs. 12, 13, 14, 15, and 16, are representations of another kind of cock or valve, and consists of a barrel, with four ways or chambers in it, and has a cover with only two chambers, being divided by a partition working upon it; *f*, is the barrel, with the passages *d*, *e*, and *p*, *q*, as in the other figures: *w*, is the cover; the surfaces of the barrel and cover fit upon one another air-tight, and are kept together by the screw *x*, see figs. 12, 13, and 14, upon which the cover turns as an axis; *h*, *i*, are the levers, and *g*, is the spring, fixed on to the cover, by which means the cover is made to turn one quarter of a revolution at each time the flexible partition arrives at the end of its extent of vibration, and, by such movement, will alternately change the passages of the gas to and from the meter, as will be fully understood from the foregoing description. Fig. 12, is a front view of the cock or valve; fig. 13, is a side representation; fig. 14, is a section taken through the valve, showing passages *p*, and *e*, connected together. Fig. 15, is a section taken through the barrel of the cock, showing the ways or passages; and fig. 16, is a detached representation of the cover. Figs. 17, and 18, are representations of another description of valve, which may be applied to this improved construction of meter, and consists of two pipes, with T-shaped ends or cross heads, one pipe being for the admission of the gas to the meter, and the other for the purpose of conveying it away to the burner. One of the ends of each of the cross pipes enters the chamber A, the other ends enter the chamber B; upon each of the apertures of these cross pipes are mounted valves, which are worked by the movement of the flexible partition, and are made alternately to open and close the passage to and from the meter, by means of levers and springs, as before described. Fig. 17, is a plan view of the pipes and valves, showing the passages from the gas main to the chamber B, open, and the passages from the chamber A, to the burner also open: fig. 18, is a side view of the same; *d*, is the pipe leading from the gas main; *e*, the pipeleading to the burner; *b*, *b*, is the flexible partition or diaphragm; *p*, is the aperture for the admission of the gas into the chamber B; and *q*, the aperture for its exit from the chamber A, to the burner: *p**, is the opening from the gas main to the chamber A, and *q**, the aperture for the escape of the gas from the chamber B, to the burner. Each of the apertures or ends of the pipes are alternately closed by valves or plugs, connected together by rods passing through the cross pipes, which work in small bearings within the pipes. Opposite to the ends of the pipes is situated the small shaft *l*, which turns on pivots on its ends, and having a cross piece *x*, near its lower extremity, the ends of this cross piece are connected to the valves, and communicates any motion received from the shaft to them. Upon this shaft is also mounted the coiled spring *g*, and the levers *h*, and *i*, which are worked by the arms k, and q^*, extending from the flexible partition; these levers, arms, and springs, act in the same way as those described in figs. 1, 2, 3, and 4, and turn the shaft l, a part of a revolution backwards and forwards at each end of the vibrations of the diaphragm, which motion is communicated by the cross arms to the valves, and cause them to open and close the ends of the cross pipes.

"Having now described this invention of an improvement or improvements in the making or constructing of gas meters, I have only to remark, in conclusion, that the case of the meter may be made of copper, brass, iron, or other metal, either wrought or cast, or of earthenware, or any other material which is air-tight; and that the partition may be made of wood, tin, copper, or other metal, and the flexible material may be animal bladder, leather, parchment, Indian rubber, air-tight cloth, silk, or other fabric which may answer the purpose, and form an air-tight flexible partition between the two chambers A, and B, of the meter; and although I have shown it working when placed in an upright position, yet it will work horizontally, or in any other position required; and that the cocks or valves may be made of brass or other metal, with metal or glass plugs, or may be made wholly of glass if it should be thought desirable. And, I verily believe that this my specification does, in all other respects, comply with the proviso contained in the above in part recited Letters Patent."—*Inrolled in the Rolls Chapel Office, September, 1833.*]

Specification drawn by Messrs. Newton and Berry.

To WILLIAM WOODS, *the elder, of Newcastle-street, Farringdon-street, in the city of London, steel pen manufacturer, for his invention of a certain improvement or improvements in the construction of metal pens.*— [Sealed 11th October, 1832.]

THE Patentee commences his specification by observing that his improved metal pens differ from all other metal pens in their action, which is much superior; and this superiority consists in making ribs, grooves, furrows, or indentations in place of the slits, holes, or other apertures which are generally made in metal pens, for the purpose of affording elasticity.

The ribs, furrows, grooves, or other indentations, of which the Patentee claims the exclusive right, as far as regards their application to metal pens, may be made in any form, manner, or direction; either curvilinear, rectilinear, diagonally, or at right angles to the slit of the pen. The Patentee states, that by adopting this mode of giving elasticity to the pen, the flexibility and softness of a quill is retained, as well as all the delicacy and durability of the metal pen; and another advantage derivable from this invention is, that the furrows, grooves, or other indentations effectually prevent the ink or other writing fluid from flowing down on to the paper too suddenly, and thereby blotting it, which cannot be avoided in other metal pens; but yet the said furrows or grooves form suitable channels for the conveyance of the writing fluid in regular and successive quantities, until all that is held by the pen is completely used.

The Patentee has shown, in the drawing accompanying his specification, twenty to thirty different descriptions of pens, that is, having their indentations, furrows, grooves, or channels running in different ways; but, as he has claimed the aforesaid indentations, grooves, or channels in all their modifications as adapted to steel or other metal pens in the manner above described, we have not thought it necessary to show them all, but have contented ourselves with representing ten of them, these being the principle, and the others only modifications of the same. Figs. 1, to 10, in Plate XVII., represent some of the pens described by the Patentee. The cause (as the Patentee considers) that the action of these pens is superior to the common kind of steel or other pens, arises from the grooves, furrows, indentations, or channels giving gradually, one after another, in conjunction with the single slit, according to the pressure that is applied to the pen by the writer, so that they are equally applicable to the lady's delicate small hand, as to the stout and beautiful large text or other commercial handwriting.

It is observed that these pens are to be made of stouter and thicker metal than the common pens, and their indentations, grooves, furrows, or channels may be made all over the surface of the pen, both externally and internally. The channels, furrows, or grooves are not only useful for the purpose above described, but they may be made subservient to ornamenting the pen.

In conclusion, the Patentee says, that he does not mean or intend to confine his claim to the direction or number of the grooves, furrows, channels, or indentations as above described, as many more may be suggested; but what he does claim as his invention is, the adaptation of indentations, furrows, channels, or grooves made in either the interior or exterior surface, or both, of the steel or other metal pen, for the purpose of giving elasticity, as before described.—[*Inrolled in the Inrolment Office, December,* 1832.]

To Thomas Wrigley, *of Bridge Hall Mills, near Bury, in the county of Lancaster, paper maker, for an improved pulp strainer, to be used in making paper.*—[Sealed 20th June, 1833.]

This invention consists in a machine or apparatus for straining the pulp of which paper is made, whereby the pulp is cleared from knots, lumps, dirt, and other extraneous matters.

Plate XVII., fig. 11, represents a section of the whole apparatus: *a,* is the pulp vat or reservoir; *b,* is the strainer, consisting of two cylinders *c,* and *d,* one within the other, having perpendicular slits or openings extending from top to bottom; these openings are generally made the width required for the coarsest paper, which is about the sixteenth of an inch; and the apparatus is so constructed, that the strainer may be made available also for the finest quality of paper, as will be hereafter described.

A piston *e,* works up and down in the straining cylinder, but does not touch the sides of the inner cylinders, consequently its action will only cause a slight degree of exhaustion: *f,* is the piston rod, working in two stuffing boxes *g, g.* A reciprocating motion is given to the rod and piston by means of the rotary crank *h,* above. Upon the crank shaft, a toothed wheel *i,* is fixed, and a small pinion *j,* on the shaft of the band pulley, gears into this wheel. By these means, the moving power is communicated from the band pulley to the piston, and the apparatus is put in action. Two exit pipes *k,* and *l,* communicate with the top and bottom parts of the interior cylinder, and have stop cocks and valves opening outwards; these two pipes conduct the pulp, after it has been strained, into a receiving chamber *m*, placed on one side of the vat, and a small pipe *n*, conducts the pulp from this chamber into the paper-making machine, or into any vessel that may be placed to receive it; the use of the receiving chamber *m*, being only to receive the strained pulp from the two pipes *k*, and *l*, not to retain it. The strainer is constructed by two cylinders, one inside the other; these are accurately fitted so that no pulp can get between them; and, in order that their construction may be more clearly understood, they are shown in horizontal section at the detached view fig. 12. It will be here perceived, that these cylinders may be so arranged that any quality of pulp may be strained through them. For instance, if a very fine writing paper is wanted, the workman has only to move the inner cylinder a very small distance, and the solid parts or bars of the inner cylinder partially close the slits or openings of the outer cylinder, thus effectually preventing any thing but the filaments of very fine pulp from making its way through the slits or perpendicular openings.

The manner in which the Patentee proposes to effect the adjustment of the straining cylinders will be better understood by reference to figs, 12, 13, and 14; *o*, *o*, are two bolts, sliding in slots in the top plate of the cylinders, which bolts are attached to a cross piece connected to the inner cylinder, as shown at *p*, in fig. 12; *q*, is a screw shaft, having a curved recess in it for the bolt *o*, to work in. The shaft *q*, shown detached in fig. 14, is supported and works in screw blocks *r*, which are fixed on the top of the outer cylinder, and remains stationary. As the screw shaft *q*, is turned round, it will gradually move forward or backward by the bolt *o*, and by this means alter the position of the interior cylinder, so that any degree of fineness may be obtained.

The pulp vat or reservoir being filled with unstrained pulp as high as the top of the cylinder, and motion being given to the pulley by any convenient power, that motion is communicated to the crank shaft by the wheel and pinion, causing a reciprocating action of the piston, by which a partial vacuum is formed; first, in the upper part of the cylinder above the piston, and then in the lower part of the cylinder below the piston. As the piston rises, the pulp in the reservoir will be drawn into the cylinder by the partial vacuum there formed; and, as the knots, lumps, dirt, and other extraneous matter cannot pass between the very narrow space allowed for the admittance of the pulp, they will, of consequence, adhere to the outside of the strainer; and, if not removed, will, in time, so clog up the slits or openings, that the pulp will not be able to pass. It is, therefore, proposed to effect their entire removal in the following manner:—In the two pipes *k*, and *l*, are placed stop cocks and valves as before described, which must be so regulated and adjusted, that they will not allow so much pulp to pass as is drawn into the straining cylinder by the vacuum; the consequence of this will be, that a certain quantity will remain in the cylinder; and, as the piston descends, it will be forced out through the slits or interstices, and, by this means, drive away the knots, lumps, or other extraneous matters that may be accumulated round the cylinder, and which, by their specific gravity, will fall to the bottom.

The Patentee says, in conclusion, that having now described his invention, and in what manner the same may be carried into effect, he claims, as his invention, any machine or apparatus of any form, shape, or construction whatever, whether like his or any other, for straining the pulp through a cylinder, in which the knots, lumps, dirt, or other extraneous matters are repelled from the strainer, and the strainer kept perfectly unclogged, in the manner before described.—[*Inrolled in the Inrolment Office, December,* 1833.]

To JOHN SPRINGALL, *of Oulton, in the county of Suffolk, iron-founder, for his invention of an improved corn stack stand.*—[Sealed 7th March, 1833.]

THE object that the Patentee has in view, and which he conceives he has perfectly attained by the present invention, is, firstly, allowing the air to penetrate into the interior of the stack through the bottom, for the purpose of preserving the corn free from damp; and, secondly, by the peculiar construction of such stack stand, preventing any vermin, such as rats and mice, from getting into the stack and destroying the corn.

The manner in which it is proposed to effect this object, we shall endeavour to describe nearly in the Patentee's own words, reference being had to fig. 15, Plate XVII., which represents a plan or horizontal view of the improved corn stack stand, consisting of three cast or wrought iron rings *a, b, c,* which are jointed or connected together by iron rods *d, d, d,* radiating from the centre of the stack; these rods are held in their places by screw-nuts and bolts. The smaller or inner ring *c,* is connected to a cast iron plate *e,* shown detached in section at fig. 16, by other radiating arms *f, f,* screwed to the projecting edges of the plate *e*: thus it will be seen that all the rings are connected firmly together, in the manner above described, and the stack may at any time be easily taken to pieces and removed to any other part of the farm that may be thought desirable. The pillars or supports of the stack stand, upon which the rings rest, are shown at *g, g, g, g,* and are retained safely in their position by blocks *h, h, h, h*; these supports are intended to be made of cast iron, and their shape will be more evidently seen by reference to fig. 17, which represents an elevation of the improved stack stand; *i,* being an overhanging projection, for the purpose of preventing the rats and mice from passing up into the stack.

The Patentee proceeds to state that the stand which he has just described, is what he denominates his single stack stand, and that by connecting two or more of these single stack stands together, in the manner shown in fig. 18, he constructs what he denominates his double or compound stack stand. In this figure *a, b,* are two single stands connected together by side rods *j, j,* and rings *k, k,* so as to form a long stand, which may be suitable for some situations. It is further stated, that any number of these single stands may be joined together, in any manner that may suit the premises they are intended to occupy. The Patentee says, in conclusion, that having now described his invention, and the manner of carrying the same into effect, he hereby declares, that he claims as his invention the making of corn stack stands, in the manner hereinbefore described, and also the manner of connecting two or more stands together to form a larger one to suit the locality. — [*Inrolled in the Inrolment Office, September,* 1833.]

[We cannot exactly see in what the originality of this invention consists, as corn stack stands have been made with stone supporters or pillars, and with ventilating bases for many years, and we should conceive that they will answer all the purposes of the before described invention, which must be confined to making the pillars of iron, and causing the bars to radiate from one common centre, instead of being placed across each other, as in the common stack stand.—Ed.]

To Sarah Guppy, *of Tarway House, Clifton, near Bristol, widow, for her having invented a method of applying and arranging certain articles, parts, or pieces of cabinet work, upholstery, and other articles, commonly or frequently applied to bedsteads and hangings, and also others not hitherto so applied.*—[Sealed 27th October, 1831.]

This invention consists, firstly, in an arrangement of pieces or parts of pillars, posts, or frame-work, which are connected by an iron rod passing up the middle, for the purpose of forming a bed-post, and also in an improved drawing tester or valance for ventilation. Secondly, in making what may be denominated the foundation or ground-work of the bedstead, consisting of a frame of drawers covered with a platform, and which drawers when pulled out form steps for the purpose of enabling a person to ascend to the bed. Thirdly, in constructing an apparatus whereby the person in bed, if lame, or otherwise an invalid, may exercise his or her arms.

The first part of the invention, viz. the constructing of the bed-posts of several pieces, having an iron rod up the middle, is represented at fig. 19, Plate XVII., *a*, being the iron rod passing up through the different pieces of wood, of which the post is constructed, and which are hollowed out for the purpose. Fig. 20, is a perspective view of a bedstead complete, with all the improvements connected; *a, a, a, a*, are the posts; *b*, the platform upon which they rest; *c, c, c*, the hanging tester or valance, which may be used for ventilating or restricting the passage of the air; *d*, is the head board.

The second part of the invention consists of the adaptation of drawers, placed under the bed, to be employed as steps, for the purpose of assisting the person in getting into bed; *e*, and *f*, are two drawers, shown open, or rather drawn out. It will be perceived that they have a sliding lid at top *g*; which, when the drawers are used as drawers, must be slidden back in the way shown in the under one; at the other side of the bed, and at the back of the drawers, a back board is fixed, and when there are two sets of drawers one on each side, this back board is placed in the middle, for the purpose of stopping the sliding top or lid of the drawers when they are pushed in, so that whenever they are pulled out to be used as steps, they may be always ready and complete.

The Patentee observes, that there is another advantage arising from the use of these drawers, which is, that they prevent any flue, or other dirt or dust, from accumulating under the bed.

The third part of the invention is, the apparatus for allowing the person in bed to take exercise, as also represented at fig. 20, and in a detached front view at fig. 21. It consists of a bar of wood *h*, extending across the top of the bed, having two pulleys *i, i*, mounted in it, and over these two pulleys is drawn a cord or ribbon *j, j*, hanging down, and having handles for the person in bed to take hold of, and work up and down for exercise.

In conclusion, the Patentee states, that having described her improvements, and the manner of carrying them into effect, she claims, as her invention, firstly, the construction of the pillars or posts of bedsteads by connecting pieces, and also the arrangement of the hanging tester or valance, in the manner above described. Secondly, the arrangement and adaptation of drawers underneath the bed, which may be used for drawers as well as steps for assisting the person in and out of bed. Thirdly, the construction of an apparatus similar to that above described, by means of which the person in bed may enjoy bodily exercise.—[*Inrolled in the Inrolment Office, December*, 1831.]

To William Essex, *of Cheetham, near Manchester, in the county of Lancaster, agent, for his invention of improvements in machinery for producing rotary motion.*—[Sealed 13th July, 1836.]

This is a project for obtaining power, through the agency of water, forced by means of a pump into a series of cylinders, containing working pistons; the pressure of the water is to work the pistons in the cylinders, and by their action, power is to be communicated through the piston rod to a crank shaft, which is intended to be the rotary mover for driving any other machinery.

Whence the power beyond that expanded in pumping, and transmitted through the piston to the crank shaft is to be derived, the Patentee has not told us; but the absurdity of the scheme, if not already seen, will be evident, when we have described the arrangement of the machinery.

A frame-work is constructed, in which a cistern of water and two force pumps are mounted at one end; about the middle of the frame three cylinders are fixed in horizontal positions, having within each a working piston, properly packed; the rods of these pistons are connected to a three-throw crank shaft, from the end of which shaft, through a pulley and band, the rotary motion, or power produced, is to be communicated. The pumps are to be worked by racks and pinion, through the agency of a reciprocating lever or winch, in the same way that the ordinary air pump is worked. The water raised by these means in the pumps, is, by the returning strokes of the reciprocating lever, forced through branch induction pipes into the ends of the cylinders behind the pistons, by the force of which the pistons are projected, and their rods made to act upon the crank shaft.

A stop cock or valve is inserted in each of the induction pipes, and similar cocks or valves are also inserted in the eduction pipes, or those by which the water is discharged from the cylinders. The induction or eduction cock or valve of each cylinder are respectively connected by a small rod, which causes them to work simultaneously, that is, when the induction is closed that the eduction shall be opened; slide rods are also connected to these cocks or valves, which are acted upon by the piston rods, and hence, as the movements of those rods are governed by the rotation of the three-throw cranks, the valves are worked which admit the water into and out of the cylinders.—[*Inrolled in the Inrolment Office, January*, 1837.]

To Henry William Nunn, *of Whippingham, in the Isle of Wight, bobbin-net lace manufacturer, for his invention of improvements in manufacturing certain kinds of embroidered lace.*—[Sealed 27th March, 1834.]

This appears to be intended as an improvement upon a former invention, for which a patent was granted February, 1833, to Messrs. Nunn, Mowbray, and Alabone. (See the fifth vol. of our Conjoined Series, page 358.) The present proposition, as far as we can understand it, seems to be to produce in any of the ordinary lace-making machines, narrow breadths of bobbin-net, with blonde, purl, vandyked, and embroidered edges, laced together into broad sheets, which when finished, bleached, and dressed, may be separated into the various breadths by drawing out the lacing thread.

The manner of effecting this is stated to be, by removing certain of the bobbins and carriages, in order to produce spaces in the net in which the straight warp threads only appear, and upon these straight threads the embroidering gimp threads are to be worked by a series of extra guides and needles, in the way they are usually worked in the machine, called the warp frame.

No drawing of mechanical arrangement accompanies the specification, as it is stated that every kind of lace-making machinery applicable to the object is claimed; we do not, however, see distinctly the points of invention, on which this patent rests.—[*Inrolled in the Inrolment Office, September,* 1834.]

To SIR JAMES CALEB ANDERSON, *of Bulevant Castle, in the county of Cork, Ireland, Baronet, for his invention of certain improved machinery for propelling vessels on water, which machinery is applicable to other useful purposes.*—[Sealed 2nd August, 1831.]

THE first feature of improvement proposed in the specification of this patent, is a peculiarity in the construction of a paddle-wheel for propelling vessels on water. The paddles are severally connected by joints to the rims of two wheels, the one wheel being placed excentric, the other concentric to the main axle, consequently, as the wheels revolve, the paddles will all be made to turn upon their joints or double axles, and preserve the same parallel positions in every part of the wheel's rotation. This is acknowledged to be a very old scheme, adopted for the purpose of causing the paddles to enter the water edge-wise, and after passing through the water in positions at right angles, or nearly so to the surface, leaving the water edge-wise, and is said to be a construction of paddle-wheel, in which the least quantity of power is lost. The Patentee, consequently, does not claim this construction of paddle-wheel as new, but only the form of paddle adapted thereto, and the manner in which the axle of the wheel is mounted.

The paddles themselves, if we rightly understand their description, instead of being formed by flat boards or plates as usual, are bent down to an angle in the middle, as the Patentee expresses it, in a wedge shape, and, in consequence, in passing through the water, the hollow form of the paddle causes it to take hold of the water with better effect than if it were flat.

The bearings for the axle of the wheel are plummer boxes mounted upon the concave edges of semi-circular rails placed perpendicularly. When the wheel is to be put into operation, these plummer boxes are fixed in the lowest part of the semi-circular rails; but when, from the state of the weather, or other causes, the wheel is required to be raised out of the water, the plummer boxes are loosened from the rails, and are, with the axle of the wheel, drawn up one side of the semi-circular rails, by means of a windlass, or chain and pulley turned by a winch.

The second feature of improvement consists in the mode of producing power for driving these propelling wheels, which is to be obtained by manual labour instead of steam, and consists in the adaptation of a drum wheel with ledges on its periphery, upon which the crew are to step as on a tread-mill; or an endless ladder, passed round drums on which men are to step as in mounting the rattlings, and the weight of the body acting by gravitation, causing the ladder and its drum to revolve, that movement is to be communicated as a propelling power through suitable gear to the paddle-wheel axle. Or the propelling power may be obtained by a reciprocating motion, given to machinery by the crew from manual movements, similar to rowing.

The third feature of improvement, is the adaptation of those last mentioned mechanical contrivances to a carriage on land, by means of which it is to be impelled along a road.—[*Inrolled in the Inrolment Office, February*, 1832.]

To MARMADUKE ROBINSON, *of Great George-street, in the city of Westminster, navy agent, on behalf of* WILLIAM AUGUSTUS ARCHBALD, *Esq., a lieutenant in the Royal Navy, at present residing at Louisiana, in the United States of North America, in consequence of a communication made to him by the said* WILLIAM AUGUSTUS ARCHBALD, *for certain improvements in the making and purifying of sugars.*—[Sealed 27th July, 1831.]

THIS invention applies, in the first instance, to the construction of the pan in which the cane juice is to be boiled for producing sugar. The pan is to be made of copper, or at least the bottom of the pan, the sides being constructed, if desired, of pine wood; and, in the bottom of the pan, hemispherical cups are to be formed, of about six inches diameter, by beating out the metal, or by cutting apertures and braizing the cups thereto. The object is, that the fire of the furnace below may play with greater effect upon the pan, by thus extending the area of its surface. Or, instead of cups, domes of corresponding dimensions may be formed or inserted in the bottom, which will have nearly the same effect.

The second feature is a mode of discharging the liquor from the pan when the boiling operation has been completed; several pipes are introduced, leading from a close vessel above, down nearly to the bottoms of the respective cups. The close vessel is to be filled with steam from a boiler, for the purpose of driving out the air; and when this has been done, the steam cock being closed, a vacuum will be formed in the interior of the close vessel; and the cock, in any one of the descending pipes, being now opened, the liquor from the pan will immediately ascend into the close vessel, from which it may be afterwards discharged into a suitable tank or receiver.—[*Inrolled in the Petty Bag Office, January,* 1832.]

To THOMAS BRUNTON, *of Park-square, Regent's-park, in the county of Middlesex, Esq., for his having found out or discovered a new application or adaptation of certain apparatus for heating fluids or liquids, and generating steam for various useful purposes.*—[Sealed 15th November, 1831.]

THIS invention appears to consist merely in certain modifications, as to form, of the plan of constructing steam boilers and vessels for evaporating salt, described under a patent granted to the same gentleman, in March, 1831. (See our ninth volume, page 212.)

By reference to the former patent, it will be perceived that the boilers consisted principally of a combined series of flat chambers, formed by parallel plates connected in pairs in a peculiar manner, and arranged in a certain way within a furnace, the principal object of which was to produce a constant current or flow of the water through the several compartments of the chambers. The present arrangement has precisely the same object; the chambers are constructed in the same way, but differently arranged, and connected with flues, which pass through the boiler to increase the effect; and some tubular chambers are also employed.

There is no novel feature claimed under this patent, and all that could possibly be considered as new, is merely the arrangement of previously known parts, which, in our opinion, present no striking feature of advantage, or even sufficient peculiarity of form, to induce us to give plates of the figures accompanying the specification, which are numerous and elaborate, and are accompanied with rather a lengthy description.—[*Inrolled in the Petty Bag Office, May*, 1832.]

To ALEXANDER COCHRANE, *of Norton-street, Great Portland-street, in the county of Middlesex, Esq., for his invention of certain improvements in machinery for propelling or moving locomotive carriages, and giving motion to mills and other machinery.*—[Sealed 10th August, 1831.]

THE subject of this patent is, a mode of propelling carriages on land, or of actuating other machinery by manual labour, applied in the way of rowing.

In the carriage, which is to be employed as a drag for drawing a series of carriages behind it, several men are to be seated, as rowers, and their hands being applied to levers, the reciprocating movements given to those levers are communicated through rods, either to cranks on the main axles, or to clicks or drivers, taking into ratchet wheels on the naves of the running wheels, by which reciprocating movements the axles and the running wheels are made to revolve, and the carriage is impelled forward.

This mode of driving machinery has been so long known, and has been found to be so decidedly ineffectual, that it will not be necessary for us to give a more particular description of it.—[*Inrolled in the Inrolment Office, February*, 1832.]

To JOHN YOUNG, *of Wolverhampton, in the county of Stafford, patent locksmith, for his invention of certain improvements in manufacturing boxes and pulleys for windows, sashes, and other purposes.*—[Sealed 21st June, 1836.]

THIS invention of certain improvements in manufacturing boxes and pulleys for window sashes and other purposes, apply to that description of pulleys commonly called "box pulleys," and such as are generally used for sustaining the cords or lines of the counter-balance weights of window sashes; and the improvements apply more particularly to that kind or description of box pulleys which have the axle of the pulley or wheel securely fixed therein, and turning in holes or bearings formed in the sides of the box or case, and are generally denominated in the trade "axle pulleys," to distinguish them from another kind of "box pulleys," in which the pulley or wheel revolves upon a pin or axle passed through it and the sides of the box or case, and secured therein by riveting the ends of the pin on to the outside of the box, which, in this instance, is cast in one piece; and after the holes have been drilled therein, the pulley or wheel is placed in its proper situation, and the pin or axle passed through them, which secures the pulley or wheel in the box; whereas, in the former description of "axle-box pulleys," as commonly made, the case is cast in two or three pieces, the sides thereof, after having the holes drilled through them, being riveted or otherwise secured to the other or front part of the box or case, the fastenings of the sides thereto holding or securing the pulley or wheel between them.

And this invention consists in casting the said box or case of the last mentioned description of "axle pulley" around the pulley wheel, after it has been properly prepared for this purpose, the pulley wheel or roller being contained within the "core," which occupies the space forming the interior of the said box or case when it is placed within the "sand mould." The fluid metal being poured into the "mould," flows around the "core" and into the parts or spaces left between it and the sides of the "mould" or impression of the pattern of the box, by which means the box or case is cast around the pulley or wheel, which is thereby properly held or secured in its required situation, without requiring further fitting up.

The several figures in Plate XVIII. will serve to illustrate the improved manufacture of "axle pulleys." Fig. 1, is a front view; fig. 2, a side view; and fig. 3, a back view of one of the improved pulleys complete. Fig. 4, is a representation of the pulley wheel or roller detached: *a*, is the box or case; *b*, the pulley or wheel; *c*, the axle thereof. Figs. 5, and 6, are representations of the interior of the two halves or sides of the "core box;" figs. 7, 8, and 9, are side and end representations of the "core" complete, with the pulley or wheel contained therein; figs. 10, 11, and 12, are front, side, and back representations of the moulder's pattern for the box or case; and figs. 13, and 14, are longitudinal and transverse sections of the sand mould, showing the "core" situated therein. After the pulley wheels have been properly prepared, as shown in fig. 4, that is, with the ends of the axle turned in a lathe, they are severally placed within the "core box," the ends of the axles fitting into the counter sunk holes *d, d*; the "core box" is then filled with sand, which is rammed therein around the pulley wheel, so as to form a compact "core;" the impression of the pattern of the box or case is then properly formed in the sand by the moulder, when the "core," with the pulley wheel, is placed therein; the ends of the axle projecting from the "core" into the space between the "core" and "mould," as shown in fig. 14; the fluid metal is then poured into the mould, which flows into the spaces between the sides thereof and the "core," and around the ends of the axle pulley, which project from the "core;" and, as soon as the metal is cold, the operation is complete; the core sand being removed from out of the interior of the now formed box or case in the usual manner.

If it should be thought desirable, smooth turned collars, bushes, or bearings *e*, of metal, as shown at fig. 15, may be placed on each side of the case around the ends of the axis of the pulley wheel, as seen in fig. 16, previous to its being put into the sand mould, whereby the fluid metal will be made to flow around the said collar, instead of coming in direct contact with the axle: this mode of operation will produce the "box pulley" shown at fig. 17, and the axle will thereby have a better bearing than in the former instance, care being taken to use such a metal or mixture of metals as will not be melted by the fluid metal of which the case is formed when it is poured into the mould.—[*Inrolled in the Rolls Chapel Office, December,* 1836.]

To James Duffield Harding, *of Gordon-square, in the county of Middlesex, artist, for his invention of certain improvements on pencil, pen, and chalk cases or holders.*—[Sealed 27th February, 1834.]

These improvements consist in the construction of an instrument for holding the chalk, crayon, or pencil for the use of an artist, in which the sides of the holder are gradually compressed or tightened, so as to confine the pencil or chalk securely in the position in which it is first placed.

In the specification, the Patentee has shown and described three different modes of constructing an instrument to answer the purpose required. The first is represented at fig. 18, Plate XVIII., and consists of a cylindrical tube *a*, which may be made of any length, to suit the pencil; on to the end of this tube is fixed, by soldering, or in any other convenient manner, a conical tube *b*, having three longitudinal slits or openings *c*, equidistant from each other. These slits or openings are for the purpose of giving elasticity, and allowing the conical sides to be compressed by the action of the ferrule *d*.

It will be seen that the slits or openings *c*, have small notches or recesses; these are for the purpose of confining the ferrule *d*, which they do through the medium of a small stud in the inside of the ferrule; this stud slides along one of the slits or openings, and when the ferrule is forced far enough along the conical tube to confine the pencil or crayon, and hold it firmly, then the ferrule is turned slightly on one side, and the stud becomes lodged in one of the notches or recesses.

Fig. 19, is another pencil or crayon holder, constructed on the same principle as the former, except that the conical tube *b*, is inverted or tapers downwards. As the same letters of reference are marked upon corresponding parts of these two figures, it will be unnecessary further to describe the latter, except to say that to compress the sides of the holder shown in fig 19, it is necessary to push the ferrule *d*, upwards; whilst, in the other figure, the same effect is produced by pushing the ferrule downwards.

Fig. 20, is another description of crayon or pencil holder; the base of the cone, in this figure, being similar to that shown in fig. 18. The tube, in this construction of pencil holder, has a screw on its outer surface, and longitudinal slits or openings are cut in the tube in the same manner, and for the same purpose, as in the former figures. The ferrule *d*, in this instance, consists of a screw box, which, by being screwed up or down, opens or compresses the sides in the same manner as in figs. 18, and 19.

Fig. 21, is an instrument upon a similar construction to the one just described, except that to compress the sides the ferrule must be screwed up the conical tube instead of down, as in fig. 20.

Another mode of constructing an instrument to hold pencils or crayons is represented in fig. 22, and consists of a long case, capable of holding an entire cedar pencil; in this instrument, the pencil is held fast by turning a thumb screw *g*, into the wood of the pencil.

The Patentee observes that this invention is equally applicable to pens; and that for the latter purpose, as well as for crayons or small pieces of chalk, it is not necessary to have the tube *a*, of any considerable length; and that, to construct the instrument of the ordinary or sufficient length, hard woods, ivory, bone, or other suitable material may be used. The Patentee further observes, that although he has represented another mode of making the instrument at fig. 22, he prefers those represented at figs. 18, 19, 20, and 21; and, in conclusion, states, that he does not intend to claim any of the parts separately, but only in combination, for the purpose of constructing a pencil, pen, chalk, or crayon holder or case, as above described.—[*Inrolled in the Inrolment Office, August*, 1834.]

To SAMUEL MEGGITT, *of the town of Kingston-upon-Hull, master mariner, for his invention of certain improvements in anchors, and in apparatus for fishing such improved anchors, which improvements may respectively be adapted to anchors now in common use.*—[Sealed 2nd July, 1836.]

THESE improvements in anchors are designed, firstly, to cause the anchors to take hold of the ground with greater facility than anchors of the ordinary construction; secondly, to cause them to penetrate deeper into any sort of ground or bottom; thirdly, to afford greater strength in the holding position; and fourthly, to lessen the risk of breaking, either in riding or weighing. And the improved apparatus for fishing such anchors, have for their object a more ready means of taking hold of the anchor than by the old fishing hook.

These improvements are represented in the accompanying drawings, and the same parts of the anchor and its appendages are referred to by similar letters in all the figures.

Figs. 23, and 24, Plate XVIII., represent what may be denominated elevations of the improved anchor, in two positions. Fig. 25, is a view of the arms of the anchor, looking down upon the crown, the shank being in section. Fig. 26, represents the under side of the same. The points or ends of the arms *a*, *a*, instead of being furnished with broad flukes or palms, as usual, are made narrow, and the breadth of the fluke is transferred by means of an angular piece *b*, to the crown. By means of this construction the point of the anchor is enabled more readily to take the ground, and also to penetrate deeper than the points of anchors of the ordinary kind, and the increased breadth at the crown, caused by the addition of the angular piece *b*, affords much greater strength and resistance against the draught of the cable with less leverage, and consequently with less risk of breaking.

Another advantage arising from this construction of anchor is, that it is scarcely possible for the cable to become foul of the arm; as in the event of the cable coming in contact with the arm, or being twisted round it, it would necessarily slip off the narrow point at the end of the arm, and thereby disengage itself.

The apparatus for fishing the anchor is best seen in figs. 23, and 26. It consists of a bar *c*, *c*, placed at the under part of the crown, this bar may be attached to the arms in any convenient manner. I prefer connecting it by links *d*, *d*, as shown, because by that means the bar will be allowed a small degree of lateral action. To this bar *c*, the fishing chain *e*, is attached, and the end of it being connected by a line to the ring of the anchor, is readily taken hold of by the seaman, who passes the stopper of the anchor to the cathead, and therefore renders a fishing hook unnecessary: this chain is attached by a loose ring to the bar *c*, which enables it to slide along the bar. The delay and inconvenience that frequently occurs in fishing the anchor in a rough sea, and particularly on dark nights, is by means of this apparatus effectually avoided, as may be seen by fig. 27, which represents a part of the head and bows of a vessel with two anchors: A, represents the anchor above described, with its fishing apparatus drawn up after being weighed in the ordinary way, and ready to be fished; B, represents another anchor in the act of fishing, having the same construction of fishing apparatus. The seaman having drawn up the fishing chain *e*, by the line attached to it, and having affixed it by one of the links or rings to the tackle *f*, the anchor is raised on the bows, and is easily slipped off again when required, there being no palms to obstruct it.

I sometimes adapt my improvements to an anchor, the shank of which is separated into two parts, and opened upwards at a considerable angle. The ends of the shank being in that case united to the ends of the stock, as shown at fig. 28. This construction of anchor will effectually prevent the possibility of the cable fouling round the stock.

It is unnecessary for me to expatiate upon all the advantages which my improved construction of anchors and fishing apparatus possess over the ordinary kinds of anchors, but I will observe that these improvements may be readily adapted to anchors of all sizes of the old construction.

Lastly, I desire it to be understood, that the particular features of improvement, which I claim under the above recited Letters Patent, are, firstly, an enlarged part *b*, at the crown of the anchor, for the purpose of giving strength to the arms, and causing them to penetrate and hold more firmly in the ground, instead of the broad flukes or palms usually employed; and, secondly, the bar *c*, or any variation of or substitute for it, by means of which a sliding chain or line may be adapted to the under part of the arms, for the purpose of what is technically termed fishing the anchor.—[*Inrolled in the Rolls Chapel Office, January,* 1837.]

Specification drawn by Messrs. Newton and Berry.

To George Jones, *of Wolverhampton, in the county of Stafford, iron-master,* James Foster, *of Stourbridge, in the county of Worcester, iron-master,* John Barker *and* John Jones, *both of Wolverhampton, aforesaid, iron-masters, for their invention and improvement on the process now in use for producing or making malleable iron.*—[Sealed September 8th, 1832.]

This invention consists in taking the molten iron direct from the blast furnace, where it is smelted from the iron ore, iron stone, iron slag, or scoria, containing iron, and conveying it immediately into the puddling furnace, there to undergo the process of puddling, instead of first making it into pig iron.

The melted metal is run out direct from the blast furnace into iron ladles or other suitable vessels, and conveyed from thence, by means of the said ladles, into the puddling furnace; and when this furnace is fully charged, the melted metal will be in the same state as if it had been re-heated or re-melted from the pig iron.

In iron-works, where the respective situations and levels of the smelting and puddling furnaces are such as to allow of a direct communication, it is evident that the melted iron may be conveyed direct from one furnace to the other, by means of canals, without the intervention of the iron ladles or other suitable apparatus, thereby saving much labour and time; and where the situation will render this practicable, it is considered that it would be advisable so to do: this latter arrangement is therefore strongly recommended.

The Patentees state in conclusion, that they wish it to be understood, that they mean and intend to claim as their invention, the conveying of iron in a melted and fluid state direct from the blast furnace, instead of re-heating and re-melting it from the pig, whereby much time and labour is saved, and a great economy of fuel and iron is the natural consequence.—[*Inrolled in the Inrolment Office, March,* 1833.]

To DANIEL HORTON *and* GEORGE HORTON, *of the Leys Iron-works, in the parish of Kingswinford, in the county of Stafford, iron-masters and co-partners, for their invention of an improved puddling furnace for the better production of manufactured iron in the process of obtaining it from the pig.*—[Sealed 7th September, 1832.]

THE Patentees commence their specification by observing that, in the usual process of manufacturing iron from pigs, the iron is first passed through the refinery or refining furnace, and afterwards brought to the puddling furnace to undergo the process of puddling; and that many efforts have been made, and some processes are now in use, for the making crude pig iron into manufactured or malleable iron in the puddling furnace, without first passing it through the refining furnace. These plans, however, are said to have failed, and not to answer the purpose, owing to the high degree of temperature to which it is necessary to raise the iron in the puddling furnace, when both the processes of refining and puddling are carried on in this one furnace, the temperature being considerably higher than is usually employed in puddling furnaces; so that the advantages that may be derived from working the two processes of refining and puddling at once, are nearly, if not quite, counterbalanced by the prejudicial effects that the intense heat required has upon that part of the furnace in which the iron is puddled.

Now, the object of this invention is to construct the furnace in such a manner that the superabundant heat may be carried off, and not be allowed to act prejudicially on any part of the furnace. This is effected by some additions to, and alterations in, the puddling furnaces usually employed; and these additions consist in adapting certain vessels to that part of the apparatus where the iron is puddled, which may be exposed to the action of the atmosphere or of a current of water.

The apparatus may be modified in the following manner;—for instance, the vessels above referred to, and through which a current of water or air is made to flow or pass, may be attached to the sides of the puddling furnaces, and thick cast or wrought iron plates, of about an inch or an inch and a half in thickness, may be connected to the back and front of the furnace, and a constant stream of cold water be allowed to flow or be forced against them. This seems to constitute the whole of the invention; and the Patentees say, in conclusion, that they do not mean or intend to claim any of the parts of the puddling furnace that have been before in use, or are well known; but they restrict their claim of invention to the combination of the air or water vessels that are attached to the sides of the furnace, and the wrought or cast iron plates that are connected to the back and front of the furnace, with the common puddling furnace that is in ordinary use, these parts being for the purpose of carrying off any superabundant heat from the puddling furnace. And they also claim, the adaptation of the before-mentioned improvements to refining furnaces, as well as puddling furnaces, as the aforesaid improvements are calculated to preserve them for a considerably longer time than they are likely to last when constructed in the ordinary manner.—[*Inrolled in the Inrolment Office, March*, 1838.]

To William Cooper, *of Picardy-place, in the city of Edinburgh, in Scotland, glass merchant and stained glass manufacturer, for his invention of an improved method of executing ornaments, devices, colours, or stains on glass.*—[Sealed 10th January, 1837.]

This invention purports to be an expeditious and accurate mode of performing the operation of producing devices on glass. The manner in which the Patentee proposes to carry his invention into effect is as follows:—The glass is first to be covered or coated with a semi-transparent coating or covering, in the manner, and with the materials, described by Mr. Davenport, in the specification of the patent granted to him, and dated 4th July, 1806; which consists of a siliceous or vitreous substance, reduced to an impalpable powder, and mixed with some plastic substance, to such a consistency that it may with facility be washed over or laid on the surface of the glass in a thin coating; the aqueous particles are then evaporated from the siliceous or vitreous materials, which are retained on the surface of the glass by the adhesive nature of the material used to make the semi-transparent coating, and the glass will be found to be uniformly covered with an adhesive coating, which may be easily removed by means of a brush or a scraper, made of wood, bone, horn, or steel. Mr. Davenport's method of executing devices or ornaments on glass was by means of the hand, or in the same manner that a draftsman would draw with a pencil on paper, but the present improved manner of arriving at the same result, which is stated to be more accurate and much more expeditious, is, by the use of an instrument, commonly known by the name of pentograph.

The article to be traced or copied being placed in a proper position, the plate or sheet of glass to which the design is to be transferred is to be placed alongside of it. For drawing ornamental circles, it is proposed to use an instrument, commonly known by the name of Swabi's Geometrical Pen, which is an instrument that will, without the entire guidance of the hand, make a number of convolving curves, the one intersecting the other: this instrument is applicable to border work.

For the purpose of making a number of lines parallel to each other, either straight or curved, the Patentee proposes using an instrument, well known among engravers as a ruling machine.

Another contrivance proposed, is to use slips of paper, parchment, vellum, brass, tin, or other thin metal, with a certain pattern cut out of them, in the same manner as those pieces of thin metal are employed in the process called stencilling. The Patentee here states, that any sort of pentographer will suit his purpose, but that he prefers the more modern description of pentographer invented by Professor Wallace, of Edinburgh, and described in volume six of the "Encyclopædia Britannica;" and as it is well known, a detailed description of it here would be quite unnecessary. The method of applying this instrument to the purpose here intended, is thus described by the Patentee :—The plate or sheet of glass being prepared with a silicèous or vitreous coating or covering, in the manner described, it is to be laid upon a level table, and securely fastened in that position by means of wax or other plastic material, which is applied to the corners of the plate or sheet of glass. The design to be copied must then be fastened in a similar manner to the table, and the fulcrum of the pentograph placed between them. When every thing is thus prepared, the workman must, with great care and accuracy, draw one of the tracing points over every line of the original drawing, when the other tracing point, bearing upon the semi-transparent materials on the surface of the glass, will scrape off the coating from the glass in lines corresponding to those of the original design, leaving the glass perfectly transparent wherever it has thus travelled over the surface. In this way, drawings, maps, or other designs may be copied, reduced, or enlarged, and transferred to the surface of the glass by means of the pentograph, with which, of course, great care must be observed. The engraver's ruling machine is used for making parallel lines in any situation, either upon the design or upon the border, in which latter place it will be found most useful. The geometrical pen is also used in the border line work, for producing ornamental curves, so that a sheet or plate of glass may be ornamented by any one of the before mentioned methods separately, or by all of them combined if it be thought desirable to produce an elaborate and beautiful design. It may be here observed, that if it should be found necessary, the design may be touched up or finished by the hand, after it has been thus transferred by the instrument, with a pencil or tracing point, such as are used by engravers in the process called etching, which the above mentioned process of ornamenting glass closely resembles, as the engraver, for etching, covers the copper plate over with a waxy composition, and etches or cuts away with the tracing point such parts of the wax as are wanted to appear as lines on the surface of the copper plate; and, in the present invention, the tracing point of the pentograph, or of the ruling machine, cuts away the siliceous or vitreous coating or covering from the glass, leaving the lines or other marks that it has made on the glass perfectly transparent.

Another method of ornamenting the glass with different devices, is by means of stencilling; the pattern or design is cut out of the slips of vellum, parchment, paper, sheet brass, or other thin metal, as before mentioned, and placed flat on the plate of glass; and after breathing on the surface of the glass to loosen or dampen, if it be required, that part of the siliceous or vitreous coating or covering that it is intended shall be removed: the workman then takes a brush and brushes the siliceous or vitreous particles off wherever the surface is exposed through the apertures of the stencilling plates, leaving the surface of the glass perfectly clear and transparent.

The Patentee here observes, that, perhaps, the design or pattern thus transferred or wrought on the surface of the glass, may require some finishing touches in a similar manner to the design or drawing executed by the pentograph and engraver's ruling machine; but such hand work does not constitute any part of the present improvements, such work having been before performed by other persons. The principal advantages derivable from these improvements are, the great expedition with which any drawing or design can be copied, as, in the old mode, every line is to be drawn by hand with a pencil or tracing point, by a distinct operation, which renders the performance exceedingly tedious. In the old method, that part of the operation that the Patentee proposes to do by means of the stencilling plates, the outline of the design was first accurately drawn upon the surface of the glass, and the superfluous ground contained within the outlines was scraped off with a tracing point or pencil made of wood, horn, bone, or ivory; whereas, by the present improvements, the workman has nothing more to do than to put the stencilling plate down on the surface of the glass, and brush away all the superfluous siliceous or vitreous coating that is seen through the apertures in the stencilling plate, care being observed that he confines the action of the brush within the limits of the stencilling plate.

The stencilling process is more particularly applicable to thick border line work, but it may also be used as a sort of foundation to work upon, without any prior tracing or transferring by means of any of the before-mentioned instruments, the outline of the drawing or design being cut out of the stencilling plates, it may be filled up by hand or by the help of the pentograph. The manner of fixing or impressing the device upon the surface of the glass after the pattern has been transferred, or drawing or design executed to the workman's satisfaction, in the way described, is by putting the plate or sheet of glass into such a heat as will fuse or partially fuse the siliceous or vitreous coating or covering, and, by this means, incorporate it with the glass, thereby leaving the design imprinted upon the glass, and those parts or lines that have been removed by any of the processes described, bright and transparent, and also firmly fixing the siliceous or vitreous coating, so that it cannot be rubbed off when it is used.

The colours are applied by laying the stencilling plate, with such parts cut out as are wanted to be coloured, on to the plate or sheet of glass, and pressing it down tight;

then the colour, which must be prepared of a proper quality and consistency, must be laid lightly on with a brush upon the siliceous or vitreous surface of the glass, care being taken that none of the siliceous or vitreous powder be rubbed off during the operation. The stencilling plate must be held tightly down, so as to prevent any of the colour from running under, and thus injuring or disfiguring the pattern.

This operation is sometimes done by first placing the stencilling plate on the glass, and rubbing off the siliceous and vitreous composition, and then applying the colouring matter in its place; the colours may be also applied partly where the siliceous or vitreous substances are still retained on the glass, and partly where the aforesaid substances have been rubbed off during a stencilling process. Sometimes the colours are put on both sides of the glass, by means of the stencilling plates, with only one side coated with the siliceous or vitreous composition, sometimes also both sides of the fass are coloured, when neither side is coated with the aforesaid composition. The stencilling plates for printing the different colours are applied in the same manner as card-makers apply them for printing their cards, and the consistency of the colouring matter is about the same as is used for making cards. If it be required to burn or fire the colours into the glass, then artists that are in the habit of working with colours that will withstand this heat will understand what ingredients ought to be used. If the colouring matter about to be used is considered to be too thin, then some fine transparent gum and water must be added to make the colour of the right consistency, or some fine white loaf sugar dissolved in water, or any other transparent adhesive substance may be used.

The method which the Patentee proposes of introducing several colours is by means of several different stencilling plates, all made exactly to correspond with each other, and the way in which these plates are made is this: after the design or drawing has been transferred on to the siliceous or vitreous coating, on the surface of the glass, by means of the pentograph, the sheet or leaf of card board, or other substance that may be used for making the stencilling plates, is substituted in its stead, and carefully fixed down exactly in the same place and position in which the sheet or plate of glass was previous to its removal, and that part of the design that this stencilling plate is intended for, is carefully transferred or traced on to it; and if two or more colours are wanted, then so many more plates must be prepared in the same manner, each of them having different parts of the drawing traced upon them, to answer to the different colours that it may be desirable to introduce; and each of these stencilling plates will be found to fit accurately, and correspond one with the other.

The manner of making the stencilling plates, as proposed by the Patentee, is, by soaking strong card-board in drying linseed oil, and compressing it very much by rolling it between steel rollers, such as those used by card-board manufacturers. The stencilling plates may be also manufactured from silk, cotton, linen, canvas, or any other suitable fabric, which must be made waterproof, in a similar manner to the oiled silk coverings for hats, and other articles; and the openings or apertures in the plates, for brushing off the superfluous vitreous or siliceous composition, or for laying on the colouring matter, may be easily cut out with a sharp pointed penknife.

The next improvement consists in transferring opaque lines, dots, or other marks of different opaque colours, such as black, blue, purple, &c., to the siliceous or vitreous coating or covering, which is upon the surface of the glass. The manner of effecting this is, by printing or transferring from copper or zinc plates, stereotype plates, woodcut engravings, or blocks, such designs or drawings (as may be desired) to tissue or other suitable paper; and while the ink that is suitable for this purpose is still wet and adhesive, the transfer or print must be laid with its face downwards on the siliceous or vitreous coating, which is upon the surface of the glass, and the reverse or top side of the paper must be dabbed with a linen or cotton cloth, so that the ink may adhere to the surface of the siliceous or vitreous coating. The transfer or print must then be allowed to remain in this position for some hours, or until the paper is quite dry, or, if found necessary, artificial warmth may be used to make the transfer dry quicker. When the transfer is quite dry the paper must be stripped off, and the print, or drawing, or other design, will be found adhering to the siliceous or vitreous coating on the surface of the glass.

If it be desired to burn in the transfer or print, the ink used must be prepared in the same manner as that used for transferring prints or drawings to earthenware and china; and as the process, as far as regards executing devices on glass, so nearly resembles the process of transferring prints to the surface of earthenware, a more detailed description will not be found necessary. Sometimes with the commoner articles the process or operation of transferring prints or drawings, known by the name of lithography, may be used with economy and facility, although this process is not applicable to the finer or more tasty articles. It is here observed, that the operations before described are equally applicable to curved surfaces, and that as the same means are employed to transfer devices, ornaments, or designs to curved surfaces as to flat, a detailed description of the mode of operations in the last-mentioned instances will be quite unnecessary. Sometimes it may be found desirable, or necessary, to give finishing touches to the transferred drawings, prints, or lithographs, with the hand, but as these constitute no part of the present improvements they are not claimed.

It may also be deemed desirable, in some instances, to colour or partially colour some parts of the transfer; this the Patentee does by means of the stencilling plate before mentioned, and to execute an elaborate and handsome design, it may be found necessary to employ all the processes and instruments above described; thus, for instance —For a landscape, the drawing or design may be printed on tissue paper, and transferred in the manner above described, and perhaps it would add to the beauty of the drawing, if certain parts from another design were introduced; this may be done by the pentograph, and some parts, or all, may be tinged with colour by means of stencilling plates prepared for the purpose, and the border line may be partially sketched out by means of the stencilling process, and filled up with the engraver's ruling machine and the geometrical pen.

The Patentee says, in conclusion, "Having now described the invention and the manner of carrying the same into effect, I do not mean or intend to claim as my invention the process of ornamenting glass by hand, in the manner described by Mr. Davenport, such method having been long known and tried; but what I do claim as my invention, for which I have had the above Letters Patent granted to me, is the executing ornaments or devices, drawings or designs, in outline, or in colours upon glass, with the instruments, and in the manner above described, such improvements and modifications being to the best of my knowledge and belief new, and never before used.—[*Inrolled in the Inrolment Office, July,* 1837.]

To JOHN SWAN, *of Basingstoke, in the county of Hants, brewer, for his invention of certain improvements in brewing.*—[Sealed 29th September, 1832.]

THIS invention consists in extracting from spent hops, or those hops that have been used in the ordinary process of brewing, a further quantity of the essence that may be fit for use. The Patentee states, that this object may be effected by using any of the means that are ordinarily employed for compressing any materials for the purpose of extracting the essence, but that he has contrived an apparatus that is more particularly applicable to this purpose. This apparatus consists of a frame similar to the common press, and which must be firmly fixed to the floor. In the cross beam of this frame is fixed a screw box, having a powerful screw working in it; and to the lower end of this screw, a piston, presser, or plunger is affixed. This piston works in a cylindrical sieve or strainer constructed of copper, and made thicker and stronger at the lower end than the upper. The hops which have been previously used, and the virtue extracted from them in the ordinary manner, are, after having been again steeped in water, to be placed in the cylindrical copper strainer or sieve, when a slight degree of pressure is administered to them at intervals, so as to expel the air, and then a considerable pressure is given, for the purpose of still extracting a further supply of the essence from the hops.

The Patentee employs a metal plate, having angular grooves cut in it, for the purpose of cutting and grinding the hops; and when the grooved plate has been pressed down upon the hops once, it is turned round so that the grooves may cut at right angles to the former operation.

Around the cylindrical copper strainer is placed another cylinder, which may be called a guard cylinder. This is for the purpose of preventing the liquor that is expelled from the hops from flying about. At the bottom of the guard cylinder are cut notches, for the purpose of letting the liquor run off, which it does, into a flat vessel placed underneath, to receive it, and from thence is conveyed, by means of a pipe, to any vessel that may be required.

The Patentee also proposes to employ rollers to effect this object, which he does by giving, by means of gear work, one of the rollers a faster motion than the other, and thus grinding and tearing the leaves.

The Patentee has also introduced what he calls an improved cock. It consists of a conical plug, which is lodged and accurately fitted into a conical seat, from whence it is removed when the handle is turned round, by what the Patentee calls " wings," which bear against two circular inclined planes, placed inside the barrel, which, consequently, causes the plug gradually to rise from its seat; and when the wings are turned completely round, and the cock is open, they are brought up through a hole cut in a cross piece inside the barrel for that purpose, and are there lodged, with their arms extending across the said hole or aperture, until it is desired to close the cock, when the wings are brought over the hole, and allowed to descend to the place in its seat again.

The Patentee says, in conclusion, that he does not mean to confine himself to the materials used for making the apparatus, nor does he mean to claim the precise mode of extracting a further essence from the spent hops after they have been used in the ordinary manner; but what he claims as his invention, is extracting a further quantity of the essence from spent hops, or hops that have been once used, by subjecting them to a considerable degree of pressure.—[*Inrolled in the Inrolment Office, March,* 1833.]

To Robert Charlton *and* Alfred Charlton, *both of Manchester, in the county of Lancaster, calenderers and finishers, for their invention of certain improvements in machinery used for stiffening and finishing woven manufactured goods.*—[Sealed 28th July, 1835.]

This is a machine for starching, sizing, or stiffening muslins and other fabrics called piece goods, and afterwards drying them, as they continue their progress through the machine, by means of a series of smooth copper cylinders heated by steam. The general appearance of the machine does not present any striking features of novelty or difference from others heretofore employed for the same purpose: we shall describe its proposed construction, and then state what the Patentees claim as their invention.

Plate XVII., fig. 22, represents the improved machine in longitudinal sectional elevation: *a*, is an iron cylindrical roller, revolving upon an axle mounted in side standards; *b*, is a trough, containing starch, size, or other stiffening material in a liquid state, into which the cylinder *a*, is partially immersed; and *c*, is a squeezing roller or wooden bowl bearing upon the periphery of *a*, which is pressed by an iron roller *d*, above. The end of the piece goods being drawn from a roll, and passed between the rollers *a*, and *c*, receives the sizing matter from the periphery of the revolving roller *a*, and any superfluous quantity is expressed out of the fabric by the roller *c*, the fabric going under and over guide rollers to the drying cylinders.

Rotary motion is given to the several rollers by a shaft at *e*, driven by a band and pulley, or by a winch; and upon this shaft *e*, a toothed wheel is fixed, which takes into and drives the train of wheels that actuate the sizing and pressing rollers; and a pulley on the end of the said driving shaft *e*, carries a band which actuates another pulley upon the axle of a bevel pinion, through the agency of which a lateral shaft is driven, that gives rotary motion by means of bevel gear to all the hollow drying cylinders *f*, *f*, *f*, *f*, *f*.

In operating with this machine, the fabric, as soon as it arrives at the point of contact between the sizing roller *a*, and the squeezing roller *c*, begins to elongate; therefore, in order to prevent wrinkling, the speed of the conducting rollers and of the drying cylinders must be rather greater than that of the sizing and squeezing rollers, which is effected by the driving gear; and the pressure required between the sizing and squeezing rollers is obtained by a weighted lever *g*, *g*, *g*. The Patentees say, as regards this part of the apparatus, that, "although the pressure of the lever *g*, comes on the journal or axis of the cylinder *d*, they have found it necessary, and it is of importance in this machine to get a greater pressure between the cylinders *a*, and *c*. This is effected by packing places between the axis or journal of the cylinder *d*, and the axis of the bowl *c*, so that the pressure of the lever *g*, shall be communicated to the bowl *c*, and thence to the cylinder *a*, without effecting the pressure between the rollers *d*, and *c*, more than is required. This difference of pressure may be effected by separate levers, or in a variety of ways well known to mechanics, the object being, that the amount of pressure between *d*, and *c*, shall not, at any time, be quite equal to the pressure between *a*, and *c*; for although a certain amount of stiffening remains in the cloth after leaving the cylinders *a*, and *c*, it might be lessened or decreased by a similar pressure being repeated."

As soon as the goods have passed from between the two cylinders *a*, and *c*, they are conducted by the guide rollers to the drying cylinders *f*, *f*, *f*, which are heated by steam passed into them through their axles; but the construction of these drying cylinders is so well known, that the Patentees do not think it necessary to describe them further.

The specification concludes by saying, "Now, we claim as our invention, first, the arrangement of the cylinders *a*, and *d*, and intermediate bowl *c*, by which we have, as already described, placed the iron cylinder in the lowest position; secondly, we claim the application and arrangement of the guide roller *h*; thirdly, we claim the method of procuring a superior finish, by causing a greater pressure between the cylinder *a*, and bowl *c*, than between the bowl *c*, and cylinder *d*, so that at the latter point the stiffening is taken out of the cloth only in such parts as may have been left by the imperfections of the wooden bowl *c*; and, fourthly, for the application of the gearing to keep the cloth sufficiently drawn up in its passage from the cylinders *a*, and *c*, round the guide roller *h*, to the points *c*, *d*."—[*Inrolled in the Inrolment Office, January*, 1836.]

NEW PATENT CHRONOMETER.

To the Editor of the "London Journal and Repertory of Arts, Sciences, and Manufactures."

Sir,—Seeing, in a recent number of the "Nautical Magazine," some highly complimentary remarks on Mr. Dent's newly patented Chronometer, I was induced to refer to your journal for the particulars of those improvements, and was not a little surprised at finding that the specification (published in your journal of April last) described the vaunted novelty and improvement to consist in varnishing the balance springs of chronometers to protect them from oxydation; a precautionary measure, which Mr. Dent must be very well aware I introduced in my improved chronometers in the year 1828. Feeling that if any credit was due for the invention, that credit belonged to myself; I accordingly, wrote to the "Nautical Magazine," stating my prior claim to the invention, and received for answer, in a note to correspondents, "We have received Mr. Ulrich's letter, and will attend to him when he brings forward *proofs*."

Those proofs have, sir, been subsequently submitted to the editor, but from some motives which it is not for me to impugn, they have been returned unheeded, with a note, declining their publication; I am, therefore, not only deprived of the credit of a discovery which really is found to be extremely valuable, but I am left, in the eyes of the world, with the stigma of falsehood and charlatanism attaching to my name.

Thus situated, sir, I am constrained to appeal to you; and, although it is far from my wish to engage your pages in a paper war with a contemporary upon a subject which (though of public importance) you are not personally interested in, yet I consider, from the high character your journal holds in the mechanical and scientific world, the protection which patentees and inventors have always found by a ready admission of their communications, aided frequently by your own judicious editorial remarks, that an old subscriber and patentee will not be considered as trespassing, in soliciting the use of a page or two for the purpose of laying before the public facts which are not deemed admissible through the same vehicle, that the falsehoods they refer to were propagated.

Without troubling you with copies of my letters to the "Nautical Magazine," I shall merely submit the testimonials of workmen employed by me at the time I introduced the improvements above referred to:—

"Whereas, Mr. Edward John Dent, of the firm of Arnold and Dent, No. 84, corner of Cecil-street, Strand, in the county of Middlesex, having recently obtained his Majesty's Royal Letters Patent for a process in the manufacture of Chronometers made by them, which the said Edward John Dent says will preserve them from all injury arising from damps, sea air, and impregnated atmosphere, which is of vital importance, having a powerful tendency towards obtaining a steady and better rate in the performance of chronometers in general.

To all to whom this may concern, we, the undersigned, do most solemnly declare, that Mr. John Gottlieb Ulrich, by whom we have been employed, hath submitted an office copy of the specification of the above Patent, obtained by Mr. Edward John Dent, bearing date 23d April, 1836, which we have most carefully perused and examined; and we do most solemnly declare, that the said John Gottlieb Ulrich did, in the year 1828, make use of the same precautionary means in the manufacture of his chronometers, for the preservation of their rates, and from all injury arising from damps, sea air, and impregnated atmosphere, which he, the said John

Gottlieb Ulrich, made at his shop, No. 27, Cornhill; which chronometers were submitted to public inspection in the said shop window.

Severally signed and declared before me, at the Mansion House, this 1st day of June, 1837,
(Signed) John Pirie, Alderman.

Charles Barber.
Edmund Blunt.
Wm. Thursfield Taylor.

I shall, at present, add no more; if the parties concerned think fit to reply, I shall be ready, in any way, to meet them; but that, for obvious reasons, is not to be expected; I shall, therefore, content myself with this exposé and public defence of my rights, and remain,

Sir, yours, &c.
JOHN GOTTLIEB ULRICH.

11, Red Lion-street, Whitechapel,
London, Aug. 21, 1837.

List of Patents

Granted by the French Government from the 1*st of July to the* 31*st of October*, 1836.

PATENTS FOR FIFTEEN YEARS.

To Miles Berry, civil engineer and mechanical draftsman, of the Office for Patents, 66, Chancery-lane, represented in Paris by Mr. Perpigna, advocate, of the French and Foreign Office for Patents, Rue Choiseul, for improvements in the construction of boots and shoes, and fastenings for gaiter and trouser straps thereto.

— Lefevre Chabert, merchant, represented by Mr. Perpigna, for an apparatus for torrefying, baking and roasting vegetable substances.

— Claude David, engineer, represented by Mr. Perpigna, for a new mechanical process for manufacturing casks and barrels.

To Charles Cuningham, of London, represented by Mr. Perpigna, for improvements in the preparing of oil colours.

— Antoine Perpigna, for improvements in the manufacturing of steel and iron.

— Pierre Alphonse Bronner, represented by Mr. Perpigna, for a process for preserving timber from the dry rot.

— Collier Harter, of Manchester, represented by Mr. Perpigna, for improvements in machines used for preparing and winding silk threads.

— Henri Burden, of Liverpool, represented by Mr. Perpigna, for machines for manufacturing horse shoes.

— George Frederic Greiner, of Wurthemburg, represented by Mr. Perpigna, for improvements in piano-fortes.

— Sir James Viney, represented by Mr. Perpigna, for an improved boiler.

— Pierre St. Denis, of Bastia, represented by Mr. Perpigna, for a new locomotive engine.

— Marion de la Brillantais, of Paris, represented by Mr. Perpigna, for improvements in piano-fortes.

— Hoëne Wronski, of Paris, for moveable rails.

— Eugene Vignaux, of Paris, for a method of rendering hemp threads waterproof.

— Thomas Howell, of London, for improvements in steam engines.

— François Xavier Bernet, of Lyons, for improved sweeping machines, for sweeping streets.

— Menier, Brothers, of Bordeaux, for a machine called fluid-statique.

— Bolle and Schwilgue, engineers, of Strasbourg, for a portable pump.

— François de Fontenay, of Strasbourg, for improvements in the manufacturing of transparent colours, applicable to glass works.

— Charlemagne Nicolas Blet, of Paris, for a machine for grinding plaster of Paris.

— Jarey Amiot and Labe, of Paris, for an apparatus called pyrothermes, for heating water and preserving its heat for a long time.

To Clerc and Archibald, of Honfleur, for a new method of manufacturing and refining sugar.

— Roussel Predagne, of Paris, for a new method of tanning hides.

— Gabrien Jean Julien Lairy, of Paris, for improvements in the manufacturing of chimneys and stoves.

— Amedée François Remond, of Paris, for a mechanical waggon.

— André Grégoire Degola, of Versailles, for an apparatus for curing smoky chimneys.

— De Beaujeu and André, of Paris, for a new method of extracting isinglass from substances not hitherto used for that purpose.

— Henri Elkington, of London, for a new process of gilding certain metals.

— François Grillet, of Lyons, for a transposing piano-forte.

— Moses Poole, of London, for improvements in the bobbin-net frames.

— The Count of Rochfort, of Paris, for improvements in horse collars.

— Volson and Royer Truchetel, of Nuits, for a machine for shaping, planing, and fitting the staves of casks and barrels.

— Thomas Severin Dubreuil, of Paris, for a method of producing an imitation marble.

— Antoine Dutel, of Paris, for a machine for executing every kind of sculptured work.

— Louis Joseph Sechevalier, of Paris, for improvements in that part of clock machinery which serves for striking the hours.

— Louis Victor Sire, of Lure, for improvements in the manufacturing of iron.

— The Marquis of Justroy, of Paris, for a machine which he calls a sculpturing frame.

— The Baron d'Arlincourt, of Gisors, for a process for rendering zinc inoxydable.

— André Marchant, of Rheims, for a new system of metallic teazle for dressing woollen cloth.

— Alexandre Adrien Despreau, of Paris, for a method of carving blocks used in calico printing.

PATENTS FOR TEN YEARS.

To Edwards and Chanter, represented in Paris by Mr. Perpigna, advocate, of the French and Foreign Office, Rue de Choiseul, for an improved locomotive boiler.

— Edwards and Chanter, represented by Mr. Perpigna, for an improved boiler, with a smoke-consuming furnace.

— Edwards and Chanter, represented by Mr. Perpigna, for an improved generator and condenser.

— Machu and Black, of Lille, represented by Mr. Perpigna, for an improved frame for manufacturing spotted net.

— Charles Felix Franchot, of Chateaudine, represented by Mr. Perpigna, for an improved mechanical lamp.

— Brame Chevalier, of Lille, represented by Mr. Perpigna, for the application of a new substance to the bleaching of sugars instead of clay.

— Elliott and Co., of Pont Andemer, represented by Mr. Perpigna, for an improved method of softening cast iron.

— Toussaint Marie Paul Andriot, of Semoutiers, represented by Mr. Perpigna, for a new kind of fastening for windows.

— Arrowsmith and Foster, represented by Mr. Perpigna, for improvements in the machines used for combing wool.

— Thomas Richard Harding, of Turcoing, represented by Mr. Perpigna, for improvements in machinery for combing wool.

— Claude Antoine Lesuer, of Lyons, represented by Mr. Perpigna, for an improved inking apparatus applicable to hand presses.

— Jean Antoine Dubois, of Rive le Gier, for a new blacking for shoes and harness.

— Antoine Powells, of Paris, for an improved steam-engine.

— Briderman, Brothers, of Lyons, for a new process for manufacturing plaster of Paris.

— Nicolas Elia, of Paris, for an improved writing ink.

— Pelletan, professor of physic, in Paris, for a new method of extracting the saccharine juice from beet root.

— Langlet and Leroy Renard, of Nuits, for a machine for planing the bottoms of casks and barrels.

To Antoine Arnoult Bouchet, of Tours, for an apparatus applicable to the making of indigenous or exotic sugars.

— Jules Amedée Degnoy, of Paris, for a new method of extracting the juice of the beet root.

— Jean Baptiste Dunod, of Lyons, for a new method of spinning, drying, and twisting silk, by one single operation.

— Amedée François Remond, of Orleans, for improvements in pin machines.

— Crepelle, of Paris, for an improved kind of button.

— Luke Hebert, civil engineer, of London, for improvements in the machines used for grinding corn and bolting the floor.

— Clara Margueron, of Paris, for improvements in piano-fortes.

— Caiman Duverger, of Soisy sous Etoiles, for an improved hydraulic process, applicable in lamps to the raising of oil.

— Albert Schlumberger, of Strasbourg, for a new kind of dressing applicable to cotton fabrics.

— George Taylor, engineer, of Bordeaux, for improved paddle-wheels.

— Moses Poole, of London, for improvements in the machines used for manufacturing plain or ornamental fabrics.

— Courquin Nicholls, of St. Pierre les Calais, for an improvement in the apparatus called Archimedes' screw.

(To be continued.)

List of Patents

Granted in Scotland between 22nd July and 22nd August, 1837.

To Godfrey Woone, of Berkley-street, London, for an improved method of forming plates with raised surfaces thereon, for printing impressions on different substances.—20th July.

— Robert Griffiths, of Smethwick, near Birmingham, machine maker, for improvements in the manufacture of runs or nuts for screws and nails, or spikes and bolts.—9th August.

— William Henry Goschen, of Crosby-square, London, merchant, in consequence of a communication made to him by a foreigner residing abroad, for improvements in preparing flax and hemp for spinning.—9th August.

To John Paul Newmann, of Great Tower-street, London, prussiate of potash maker, partly by his own invention, and partly from a communication made to him by a foreigner residing abroad, for improvements in the manufacture of prussiate of potash and prussiate of soda.—9th August.

— Andrew Smith, of Belper, Derbyshire, millwright and engineer, for a certain improvement or improvements in printing machines. —14th August.

New Patents
SEALED IN ENGLAND,
August, 1837.

To William Palmer, of Sutton-street, Clerkenwell, in the county of Middlesex, manufacturer, for his invention of improvements in printing paper hangings.—Sealed 29th July—6 months for inrolment.

To James Matley, of the city of Paris, in the kingdom of France, and of Manchester, in the county of Lancaster, gentleman, for his invention of a machine called a tiering machine, upon a new principle, for supplying colours to, and be used by, block printers, in the printing of cotton, linen, and woollen cloths, silks, paper, and other substances and articles to which block-printing is or may be applied, without the aid or assistance of a person to tier upon.—Sealed 2nd August—2 months for inrolment.

To Archibald Richard Francis Rosser, of New Boswell-court, in the county of Middlesex, esquire, for an invention of improvements in preparing manure, and in the cultivation of land, being a communication from a foreigner residing abroad.—Sealed 2nd August—6 months for inrolment.

To Alexander Macewan, grocer and tea merchant, in Glasgow, for his invention of a process for the improvement of teas as ordinarily imported.—Sealed 5th August —6 months for inrolment.

To Richard Thomas Beck, of the parish of Little Stonham, in the county of Suffolk, gentleman, for a new or improved apparatus or mechanism for obtaining power and motion, to be used as a mechanical agent generally, which he intended to denominate rotæ vivæ, being a communication from a foreigner residing abroad.—Sealed 9th August—6 months for inrolment.

To William Gossage, of Stoke Prior, in the county of Worcester, manufacturing chemist, for his invention of certain improvements in the processes or operations connected with the manufacture of alkali from common salt, and with the use of the products obtained therefrom.—Sealed 17th August—6 months for inrolment.

To William Gillman, of Bethnal-green, in the county of Middlesex, engineer, for his invention of an improvement or improvements in steam-boilers and in engines, to be actuated by steam or other power.—Sealed 17th August—6 months for inrolment.

In pursuance ofthe report of the Judicial Committee of her Majesty's Privy Council, to Henry Shuttleworth, of Market Harbro', in the county of Leicester, gentleman, and Daniel Foot Tayler, of the Priory, in the parish of Woodchester, in the county of Gloucester, pin manufacturer, of certain combinations of, and improvements in, machinery for making pins, being an extension of an invention for the term of five years from the 15th of May, 1838, the expiration of the former Letters Patent, granted for the term of fourteen years to Lemuel Wellman Wright.—Sealed 21st August.

To John George Hartley, of Beaumont-row, Mile-end-road, in the county of Middlesex, esquire, for his invention of an improved application of levers for the purpose of multiplying power.—Sealed 22nd August—6 months for inrolment.

To Thomas Du Bonlay, of Sandgate, in the county of Kent, esquire, and John Joseph Charles Sheridan, of Lewisham, in the same county, esquire, for their invention of improvements in drying and screening malt.—Sealed 24th August—6 months for inrolment.

To James Crellin, of Liverpool, in the county of Lancaster, and James Holt, of the same place, plumbers, for their invention of certain improvements in water-closets.—Sealed 24th August—6 months for inrolment.

To Robert Brown, of Water-side, Maidstone, in the county of Kent, engineer and iron-founder, for his invention of certain improvements in the construction of Cockle's stoves, or apparatus for drying or stoving hops, malt, grain, or seeds.—Sealed 24th August.—6 months for inrolment.

To William Hearn, of Southampton-street, Pentonville, in the parish of St. James, Clerkenwell, and county of Middlesex, engineer, and William Davies, of Upper North-place, Gray's Inn-road, in the parish of St. Pancras, and county of Middlesex, plumber, for their invention of a certain improvement or certain improvements in the construction of boilers for the generation of steam and heating water or other fluids.—Sealed 24th August—6 months for inrolment.

To William Southwell, of Winchester-row, New-road, in the county of Middlesex, piano-forte maker, for his invention of a certain improvement in piano-fortes.—Sealed 24th August—6 months for inrolment.

CELESTIAL PHENOMENA, for September, 1837.

D.	H.	M.	
1			Clock after the ☉ 0m. 9s.
	—		☽ rises 6h. 20m. M.
	—		☽ passes mer. 1h. 0m. A.
	—		☽ sets 7h. 24m. A.
	20	46	☿ in conj. with the ☽ diff. of dec. 3. 25. S.
	22	15	☿ in Aphelion.
2	5	41	♀ in conj. with the ☽ diff. of dec. 0. 38. S.
			Occul. *Venus*, im. 6h. 38m.
3	16	12	♂ in conj. with the ☽ diff. of dec. 0. 10. N.
	19	12	Vesta in oppo. to the ☉ intens. of light 1.030.
5			Clock after the ☉ 1m. 26s.
	—		☽ rises 11h. 14m. M.
	—		☽ passes mer. 3h. 49m. A.
	—		☽ sets 8h. 12m. A.
	2	17	♄ in conj. with the ☽ diff. of dec. 4. 12. N.
7	11	12	☽ in □ or first quarter.
9	10	57	☿ greatest elong. 26. 43. E.
10			Clock after the ☉ 3m. 7s.
	—		☽ rises 5h. 8m. A.
	—		☽ passes mer. 8h. 38m. A.
	—		☽ sets morn.
12	22	47	♅ in conj. with the ☽ diff. of dec. 3. 18. N.
	23		☽ in Perigee.
14			Mer. R. A. 13h. 0m. dec. 9. 48. S.
	—		Ven. R. A. 13h. 25m. dec. 8. 45. S.
	—		Mars R. A. 14h. 2m. dec. 12. 43. S.
	—		Vesta R. A. 22h. 59m. dec. 18. 8. S.
	—		Juno R. A. 14h. 20m. dec. 4. 27. S.
	—		Pallas R. A. 2h. 30m. dec. 9. 41. S.
	—		Ceres R. A. 5h. 19m. dec. 18. 49. N.
	—		Jupiter R. A. 10h. 24m. dec. 10. 54. N.
14			Saturn R. A. 14h. 46m. dec. 13. 51. S.
	—		Georg. R. A. 22h. 32m. dec 10. 6. S.
	—		☿ passes mer. 1h. 27m.
	—		♀ passes mer. 1h. 52m.
	—		♂ passes mer. 2h. 29m.
	—		♃ passes mer. 22h. 48m.
	1	28	Ecliptic opp. or ○ full moon.
	—		Occul. p Piscium, im. 8h. 9m., em. 8h. 56m.
	—		Occul. q Piscium, im. 9h. 58m., em. 10h. 49m.
15			Clock after the ☉ 4m. 52s.
	—		☽ rises 6h. 48m. A.
	—		☽ passes mer. 0h. 52m. M.
	—		☽ sets 6h. 27m. M.
16			Occul. 54 Ceti, im. 11h. 58m., em. 13h. 6m.
17	16	45	♀ in the descending node.
	—		Occul. π Arietis, im. 15h. 23m., em. 16h. 0m.
20			Clock after the ☉ 6m. 38s.
	—		☽ rises 8h. 31m. A.
	—		☽ passes mer. 4h. 35m. M.
	—		☽ sets 1h. 28m. A.
21	3	54	☽ in □ or last quarter,
22	8	59	☿ greatest hel. lat. S.
	17	38	☿ stationary.
	18	31	☉ enters Libra, Autumn commences.
25			Clock after the ☉ 8m. 22s.
	—		☽ 0h. 31m. M.
	—		☽ passes mer. 8h. 52m. M.
	—		☽ sets 4h. 55m. A.
	4		☽ in Apogee.
26	18	17	♃ in conj. with the ☽ diff. of dec. 3. 10. S.
29	8	1	Ecliptic conj. or ● new moon.
30			Clock after the sun, 10m. 1s.
	—		☽ rises 6h. 32m. M.
	—		☽ passes mer. 0h. 20m. A.
	—		☽ sets 5h. 52m. A.
	3	20	☿ in conj. with the ☽ diff. of dec. 4. 11. S.

The Satellites of Jupiter are not visible until the 21st day of this month, Jupiter being too near to the Sun ; and no eclipses visible at Greenwich to the end.

LEWTHWAITE, Rotherhithe.

METEOROLOGICAL JOURNAL,

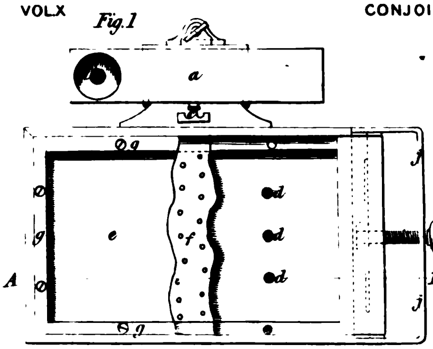
FOR JULY AND AUGUST, 1837.

1837.	Thermo.		Barometer.		Rain in inches.	1837.	Thermo.		Barometer.		Rain in inches.
	Hig.	Low.	High.	Low.			Hig.	Low	High.	Low.	
July						August					
26	76	52	30,01	Staty.		10	73	46	29,89	29,84	
27	82	41	29,97	29,82		11	73	51	29,85	29,83	
28	77	51	29,73	Staty.		12	75	47	29,94	29,89	
29	69	47	29,38	29,23	,225	13	76	43	30,11	30,04	
30	65	45	29,65	29,44	,1	14	78	40	30,18	30,15	
31	68	46	29,82	29,80	,075	15	75	40	30,18	30,12	
August						16	76	47	30,06	30,02	
1	68	45	29,71	29,64	,75	17	79	47	29,98	29,96	
2	75	50	29,65	29,61	,525	18	77	46	30,06	Staty.	
3	69	49	29,63	29,61	,05	19	77	48	30,04	29,92	
4	68	46	29,86	29,79	,0875	20	75	54	29,90	29,82	
5	65	33	30,07	30,04	,0375	21	74	48	29,99	29,94	
6	67	38	30,18	30,13		22	71	46	30,07	30,04	,05
7	67	42	30,26	30,23		23	71	45	29,98	Staty.	,2
8	68	38	30,28	30,21		24	69	44	30,10	30,08	,225
9	72	41	30,10	29,94		25	67	32	30,11	30,06	

Edmonton. CHARLES HENRY ADAMS.

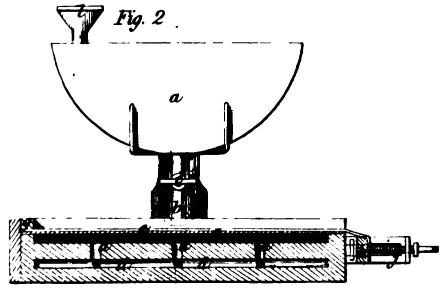
Latitude 51° 37 32 N.
Longitude 3 51 West of Greenwich.

Fig. 1



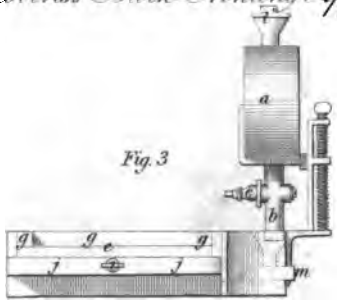
Bakewell's Soda Water Apparatus

Fig. 2



Roberts's Block Printing Apparatus

Fig. 3



De Bergue's Spinning Machinery

Fig. 4

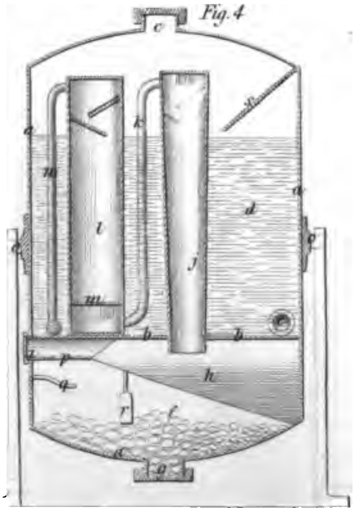
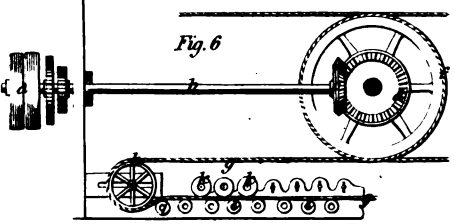


Fig. 6



Hodge's Impt. in Dying Hats

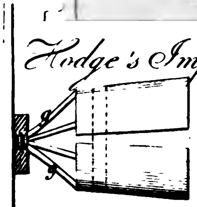


Fig. 8

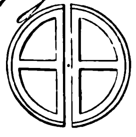


Fig. 9

Fig. 7

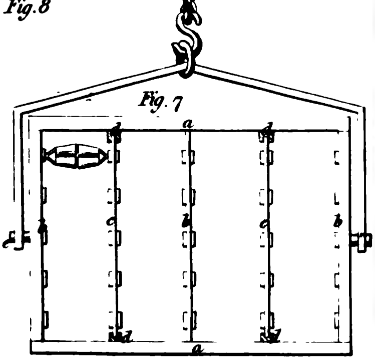
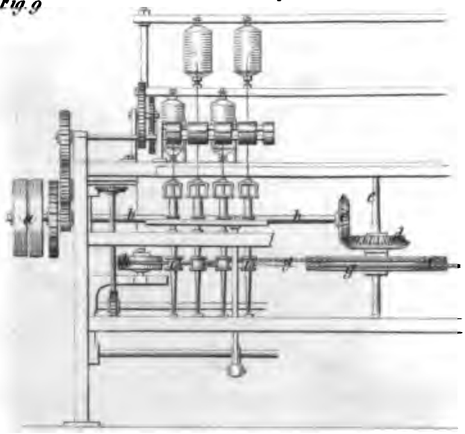


Fig. 5



W. Newton Del.t 1st April 1837. F. Yates Sculp.t

Bacon's Locomotive Engine

Fig. 2

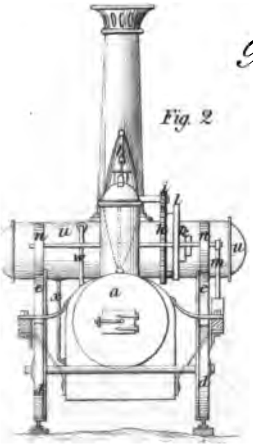
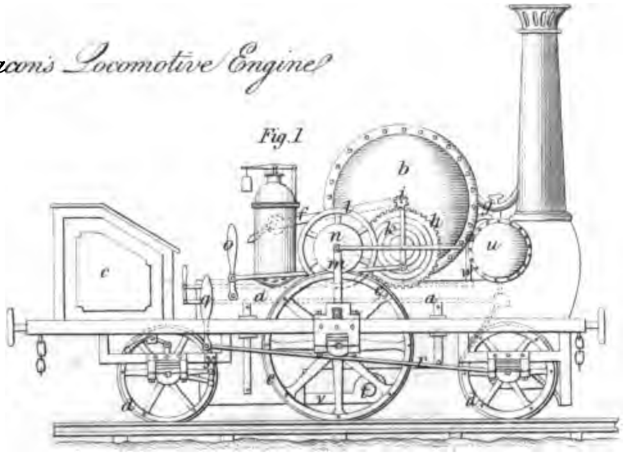


Fig. 1



Brown's Paper Machinery

Fig. 3

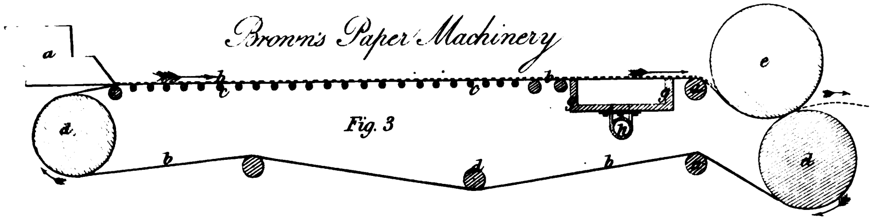


Fig. 4

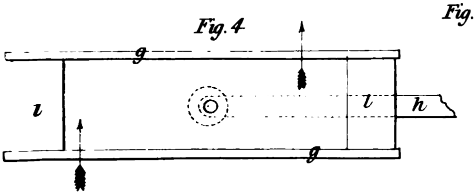
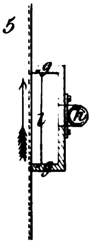


Fig. 5



Booth's Connecting Chain

Fig. 7

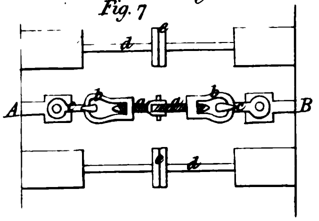
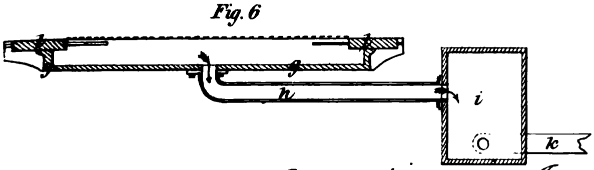


Fig. 6



Improved Iron Roofs

Fig. 9

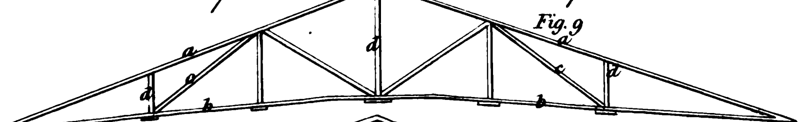
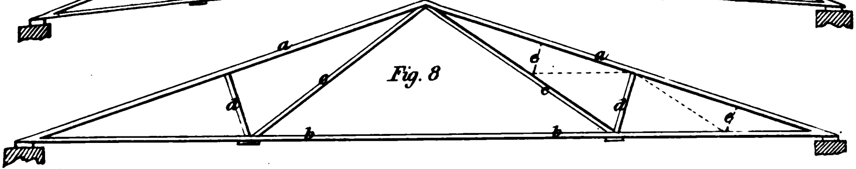


Fig. 8



Greig's Emboſsing Machinery

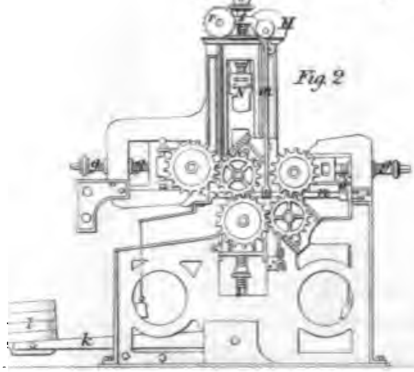


Fig. 2

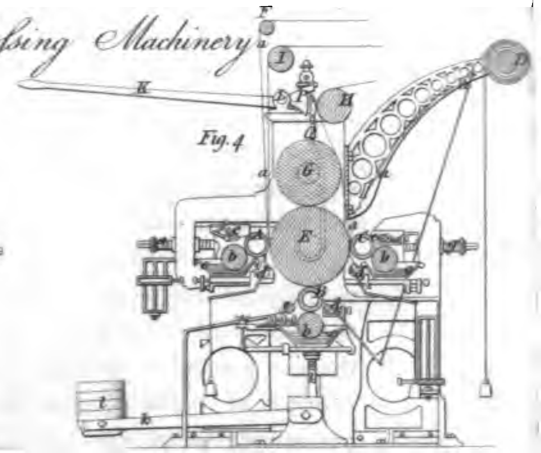


Fig. 4

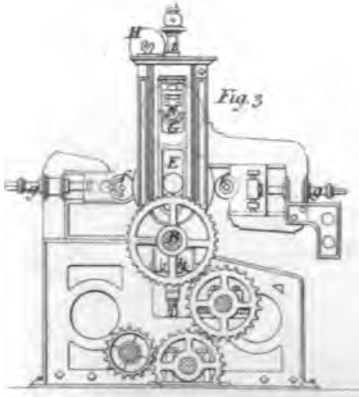


Fig. 3

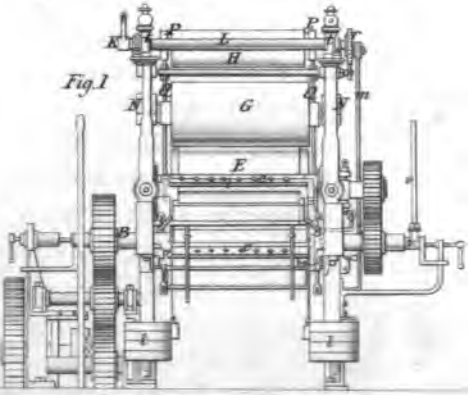


Fig. 1

Williams's Felting Machinery

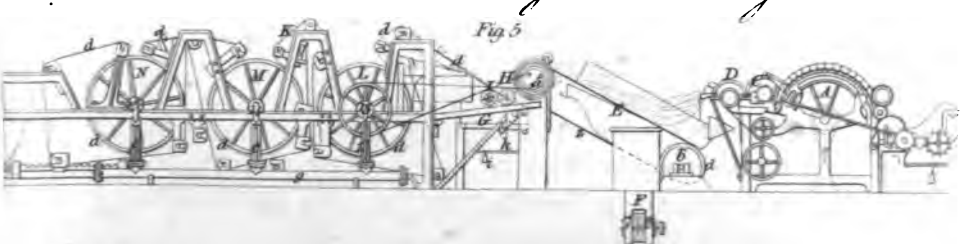


Fig. 5

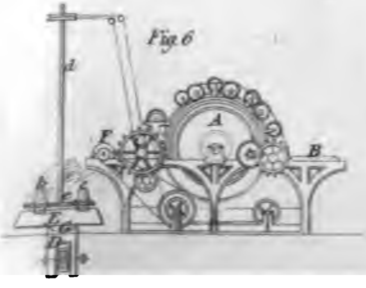


Fig. 6

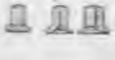


Fig. 7

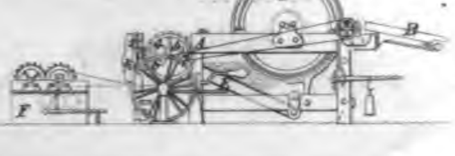


Fig. 8

Ramsbottom's Spinning Machinery

Fig.1

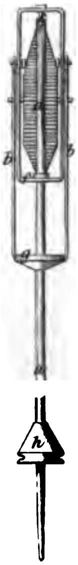
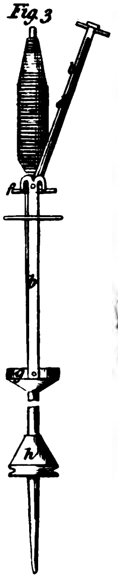


Fig.3



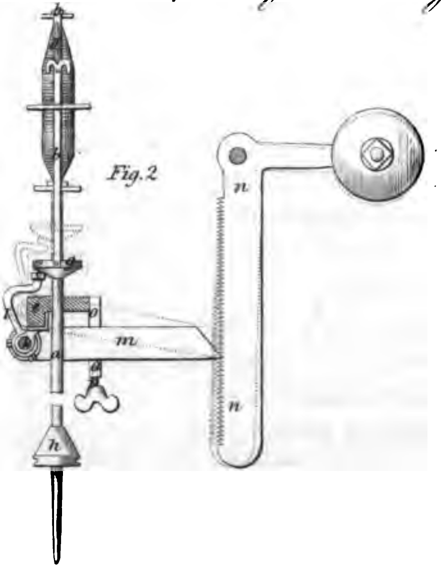
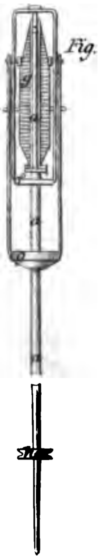
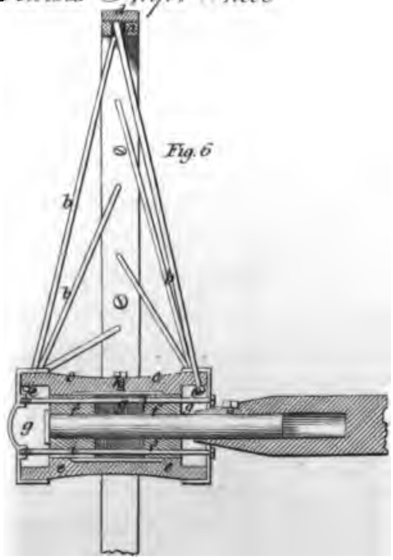


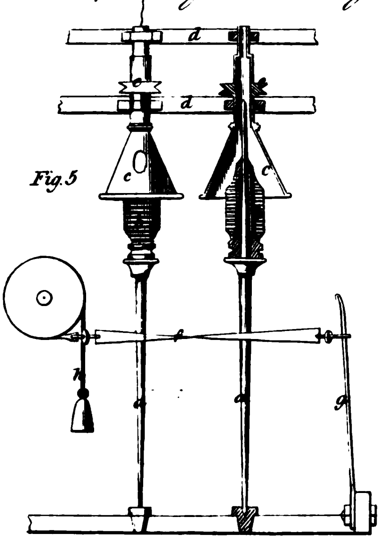
Fig. 4



Pearse's Impd. Wheel

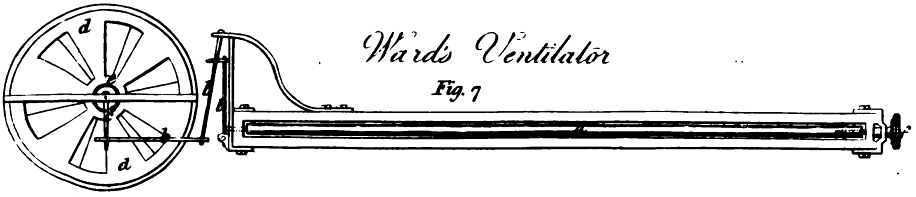


Potter's Spinning Machinery



Ward's Ventilator

Fig. 7



Newton Del. 1st May 1837 F. Yates Sc.

VOL.X

: VI.

Fig. 1

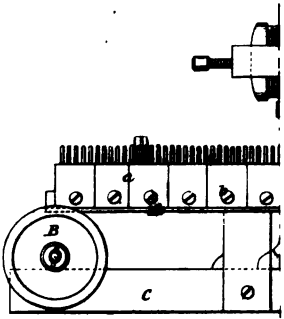
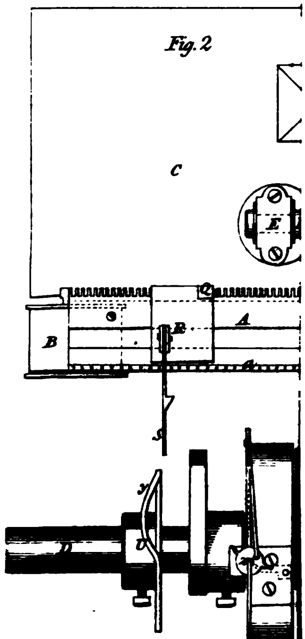


Fig. 2



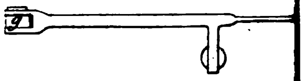
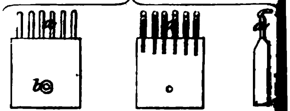
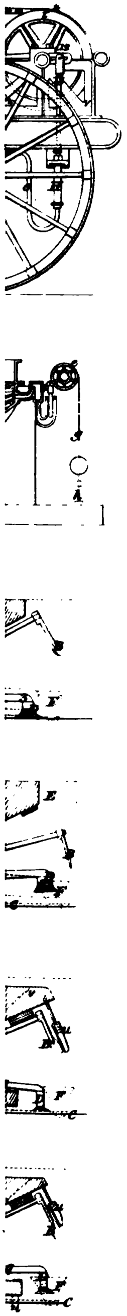


Fig. 4





W. Newton Del.

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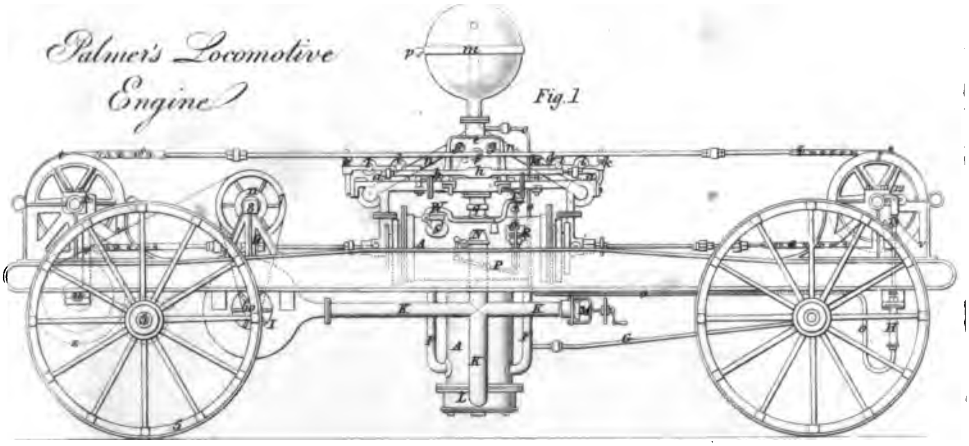
Palmer's Locomotive Engine

Fig. 1



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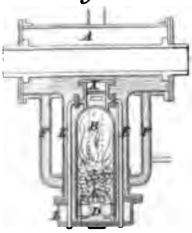

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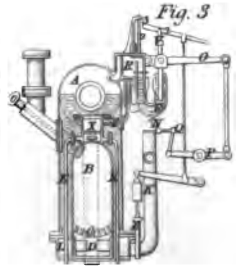

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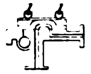
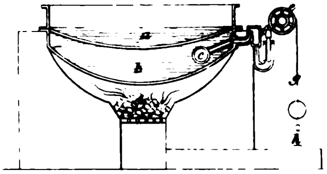


Fig. 6

Fig. 7



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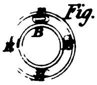
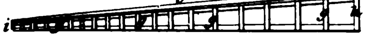


Sidel's Impts in Piano Fortes

Fig. 13



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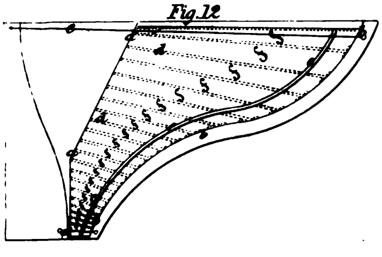

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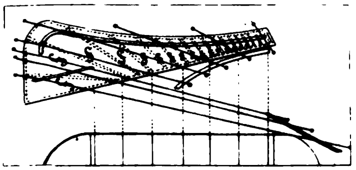

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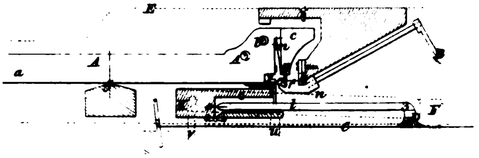

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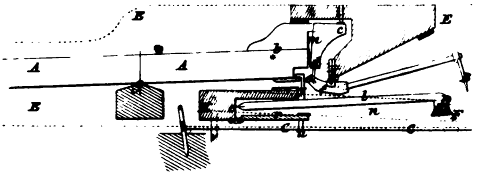

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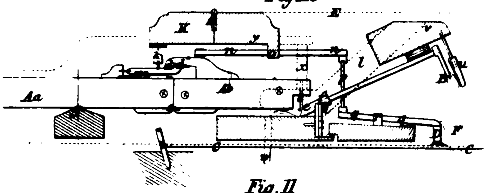

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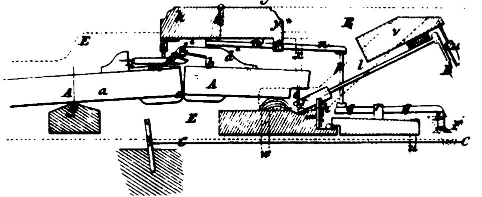

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Palmer's Locomotive Engine

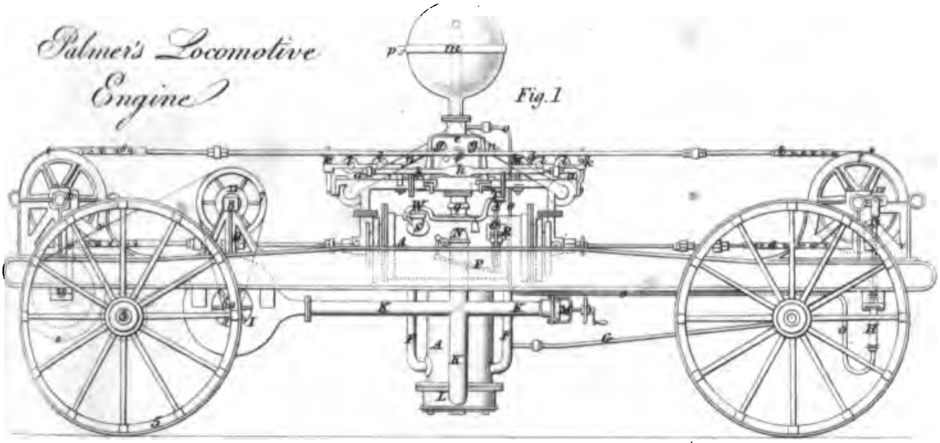
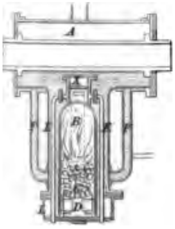


Fig. 1

Fig. 2



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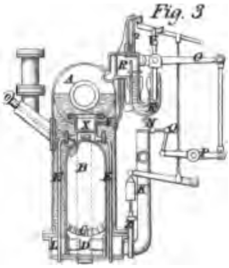

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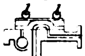

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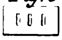

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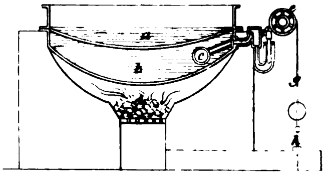


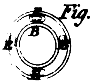
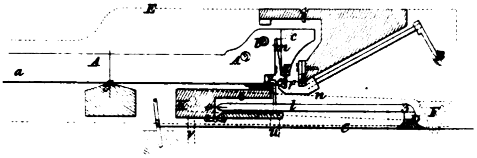


Fig. 4

Sidel's Impts in Piano Fortes

Fig. 8



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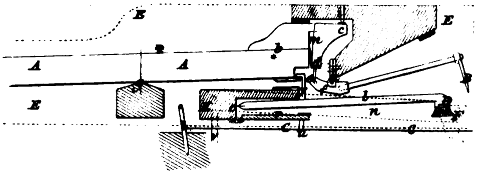

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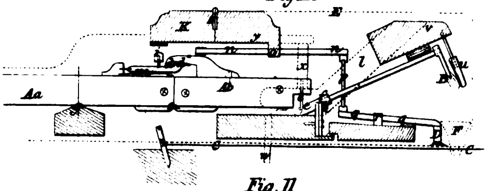

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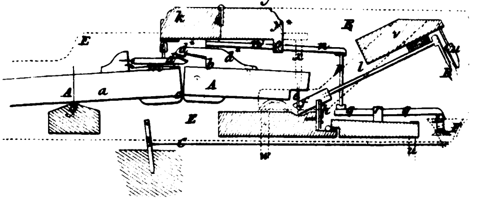

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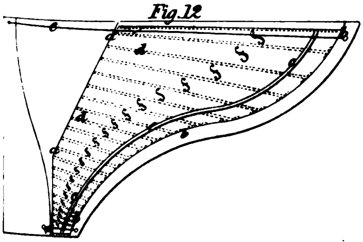

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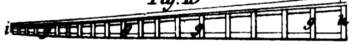

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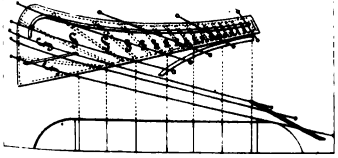

W. Newton Delt

1st June 1837

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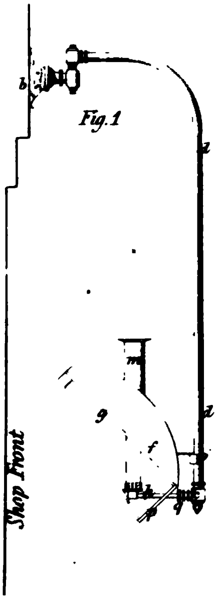
Edge's External Lamp

Fig. 1



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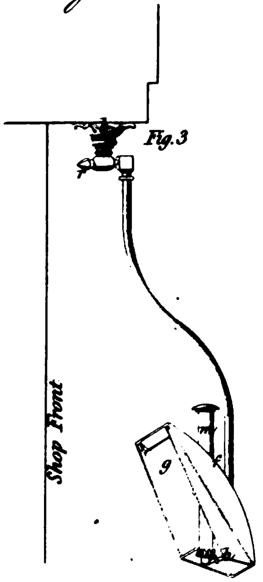

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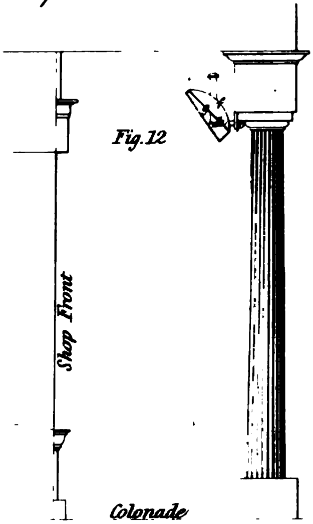

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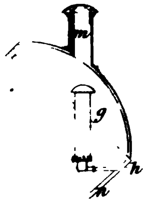

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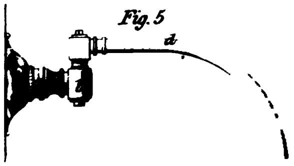

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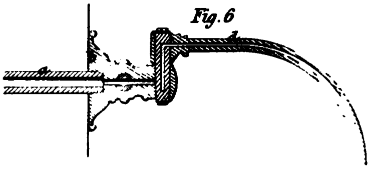

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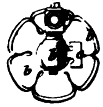

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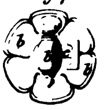

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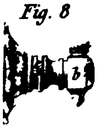

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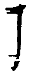

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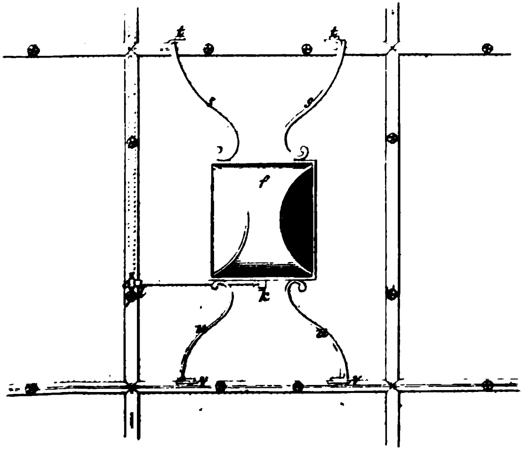


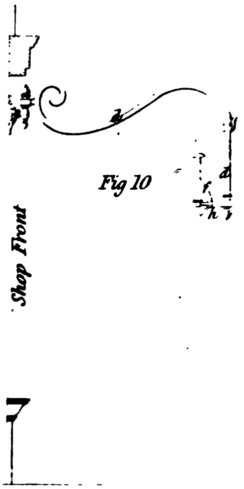
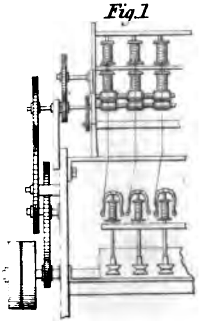


Fig 10

Wright's Impts. in Spinning Machinery

Fig. 1



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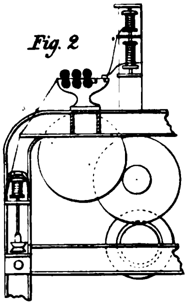

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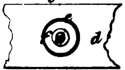

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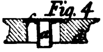

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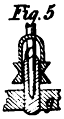

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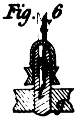

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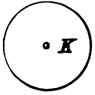

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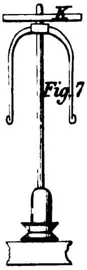

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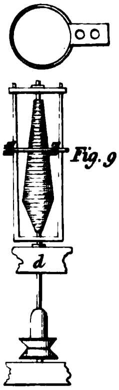

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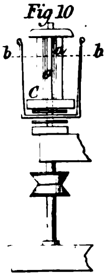

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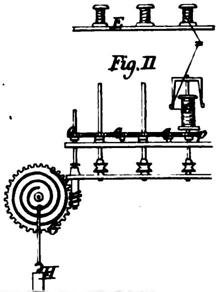
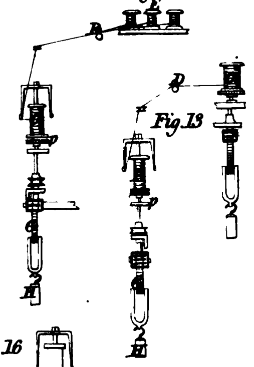


Fig. 12

Fig. 13



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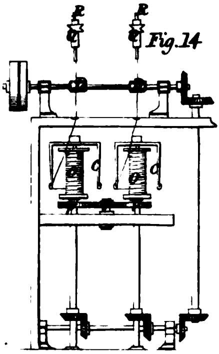

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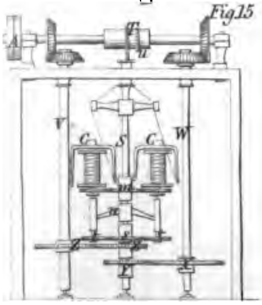

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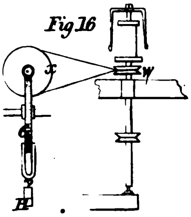
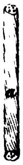


Hood & Smith's Metallic Bands

Fig. 19



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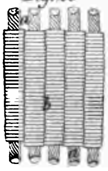

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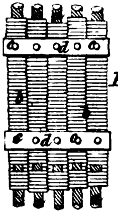
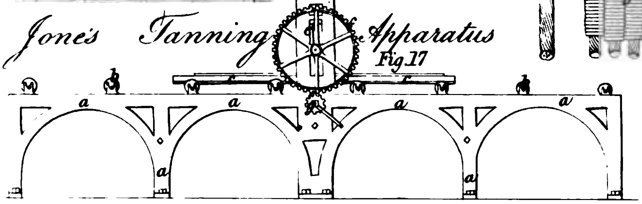


Jones's Tanning Apparatus

Fig. 17



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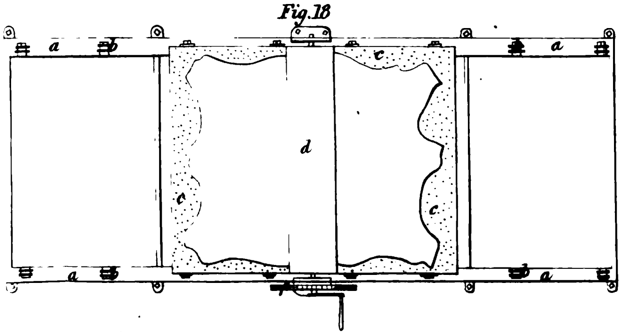

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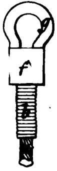

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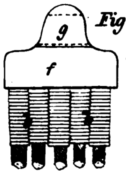

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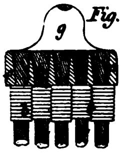

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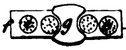

W. Newton Del. 1st July 1837. G. W.

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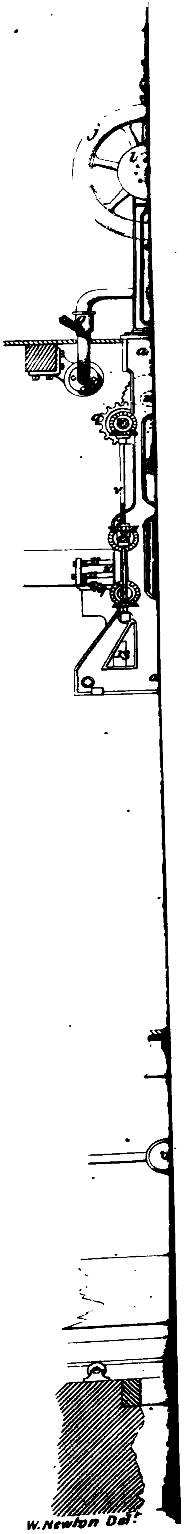

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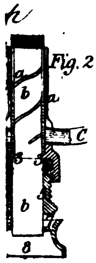

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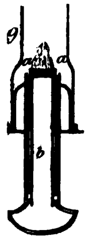

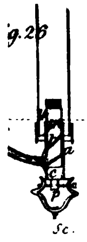

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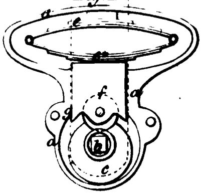
Howell's Imp.d Door Springs

Fig. 1



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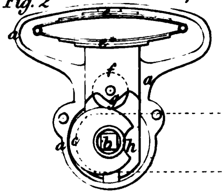

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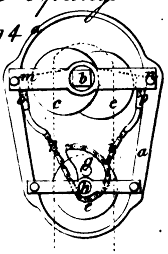

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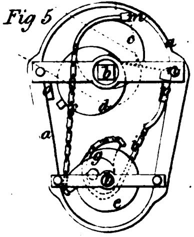
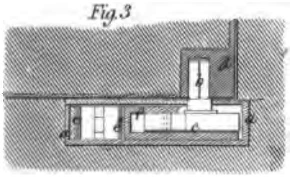


Fig. 3



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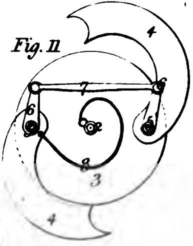

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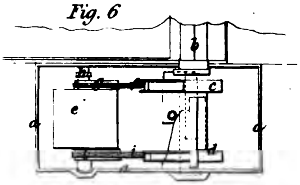

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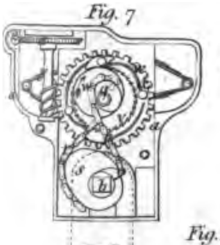

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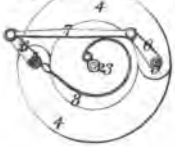

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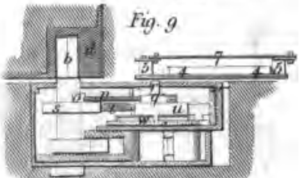

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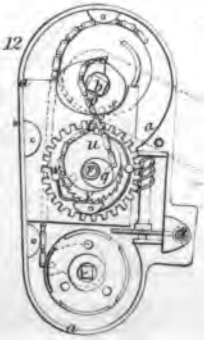

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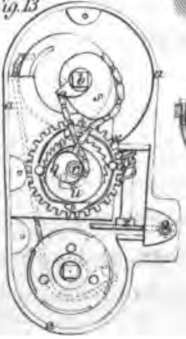

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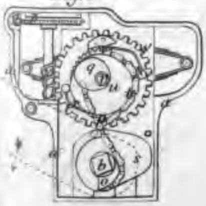
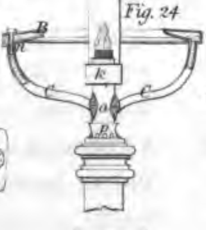


Watson's Lamp

Fig. 24



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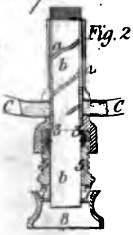
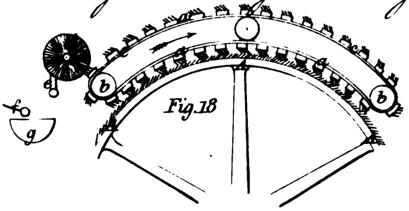


Hyde's Carding Machinery

Fig. 18



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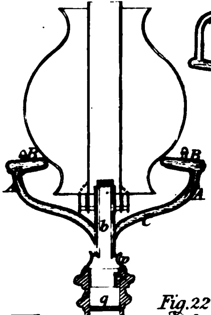

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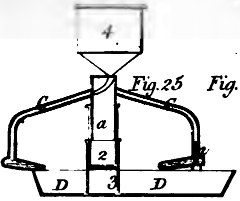

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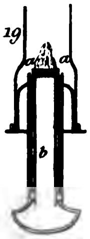
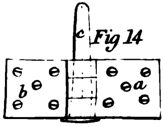


Minter's Table Fastenning

Fig. 14



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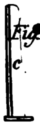

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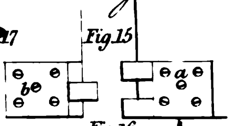

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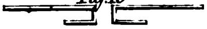
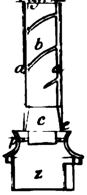


Fig. 23

Fig. 21



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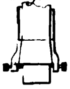

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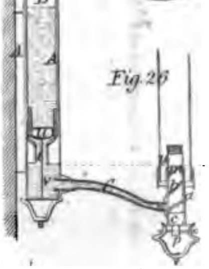
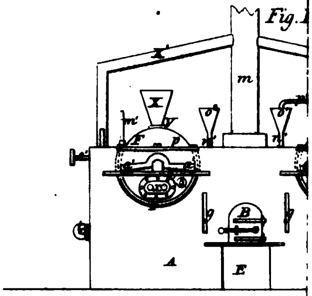


W. Newton Del.t 1st July 1837 G. Winter Sc.

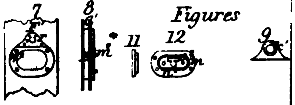
L. X

PLATE X

Fig. 1



Figures 7 8 11 12 9



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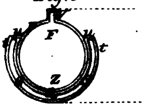

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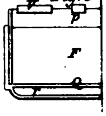

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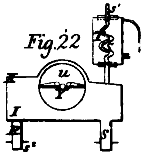

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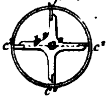

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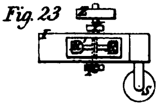

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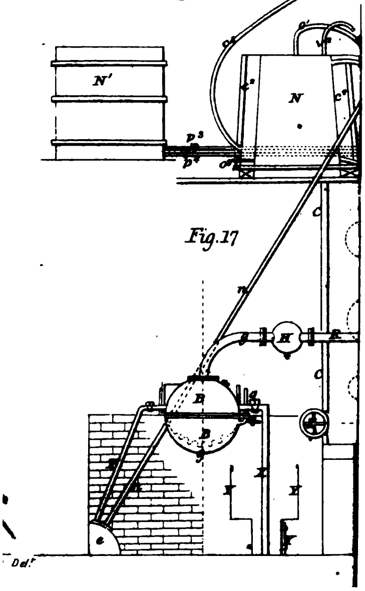

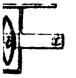

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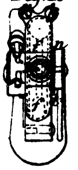
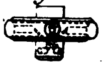


Fig. 11

Fig. 12



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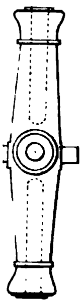

os.

Soda

Fig. 21

Del.

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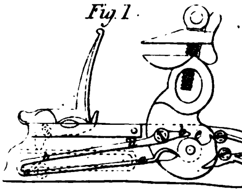
Dodd's Improved Fire Arms

Fig. 1



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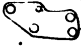

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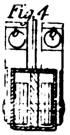

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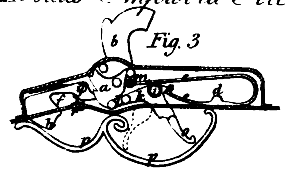

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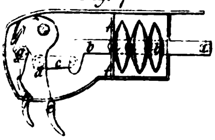

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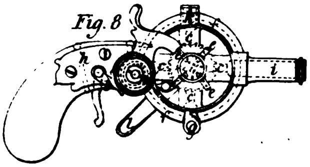

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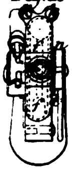

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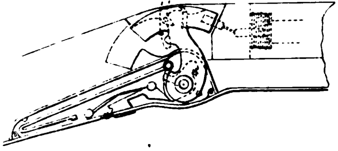

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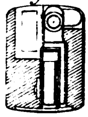
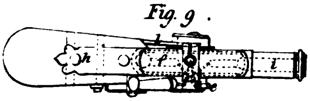


Fig. 9



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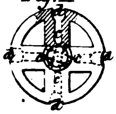

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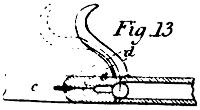

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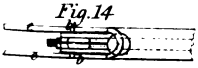

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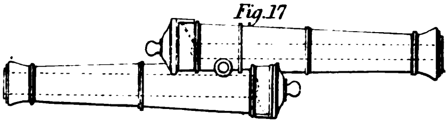

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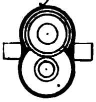

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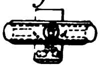
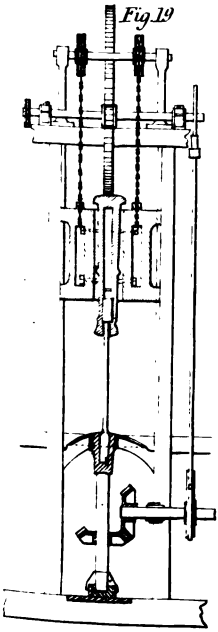


Spilsbury's Impts in Stamping Metals

Fig. 19



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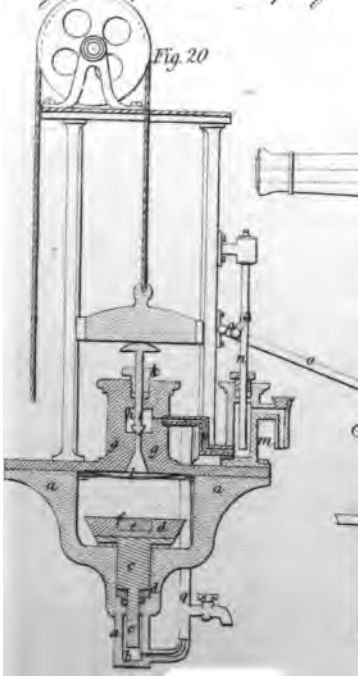
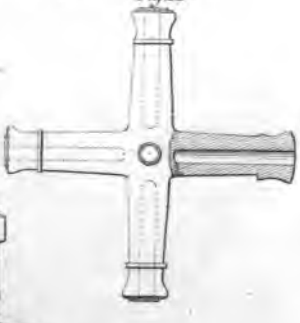


Fig. 15



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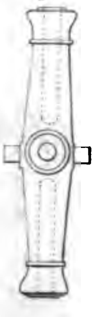


Spilsbury & Cos. Impts in making Soda

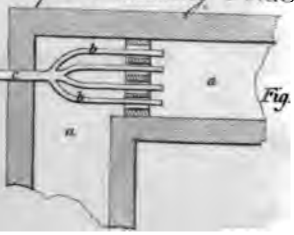


Fig. 21

Parkinson's Block Printing

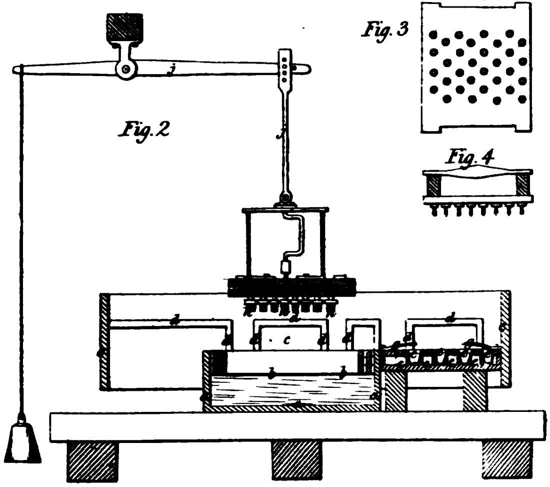
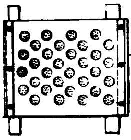


Fig. 2

Fig. 3

Fig. 4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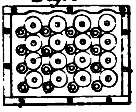
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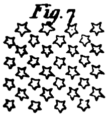
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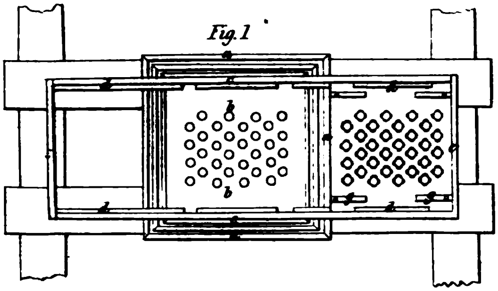
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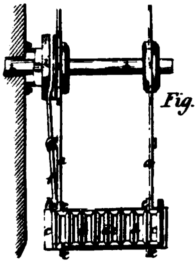
Massie's Paddle Wheel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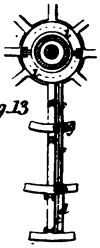
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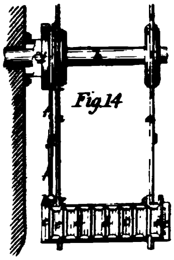
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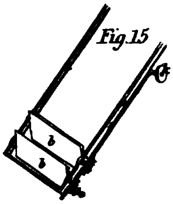
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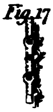
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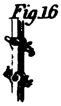
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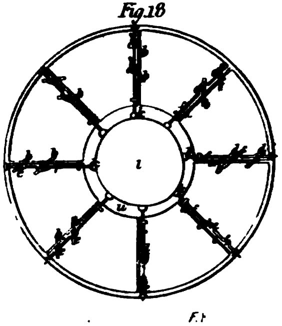
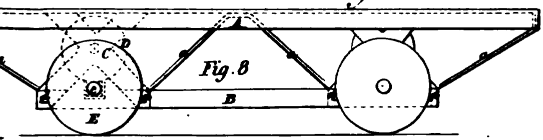


Fig. 18

Cole's Locomotive Engine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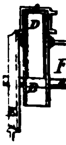
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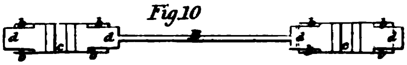
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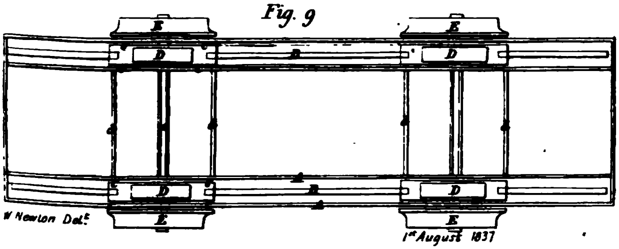


Fig. 9

W Newton Del^t

1st August 1837

F.t

Berry's Improved Gas Meter

Fig. 1

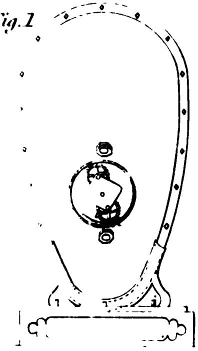
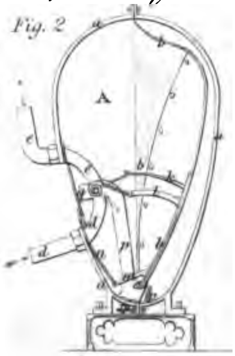


Fig. 2



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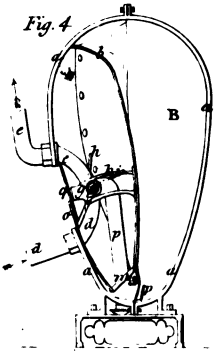

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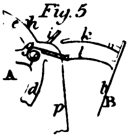

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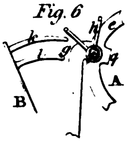

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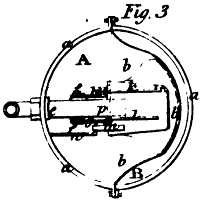

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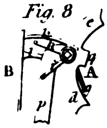

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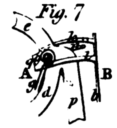

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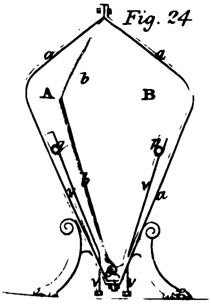

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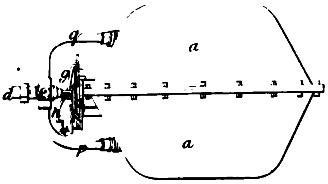

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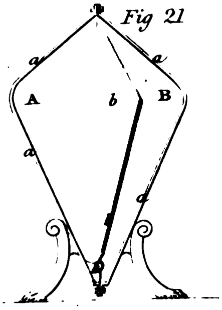

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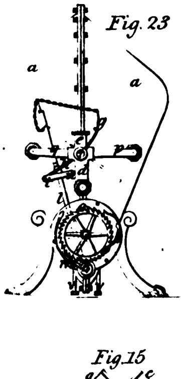

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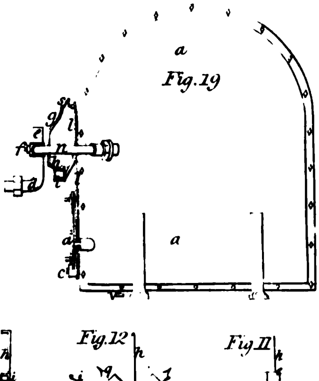

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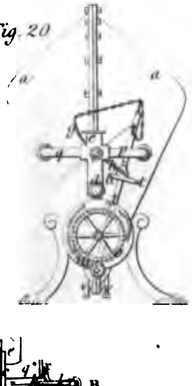

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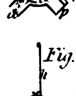

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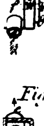

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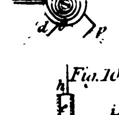

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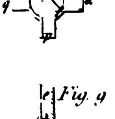

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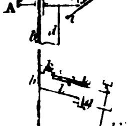

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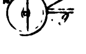

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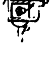

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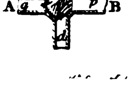

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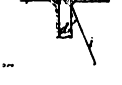

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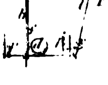
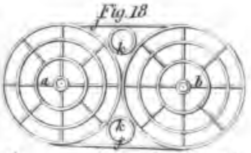


Springall's Stack Stand

Fig. 18



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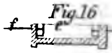

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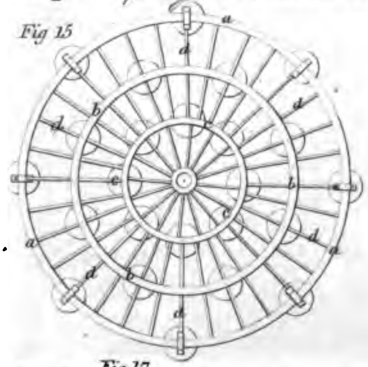

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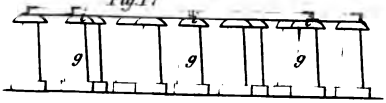
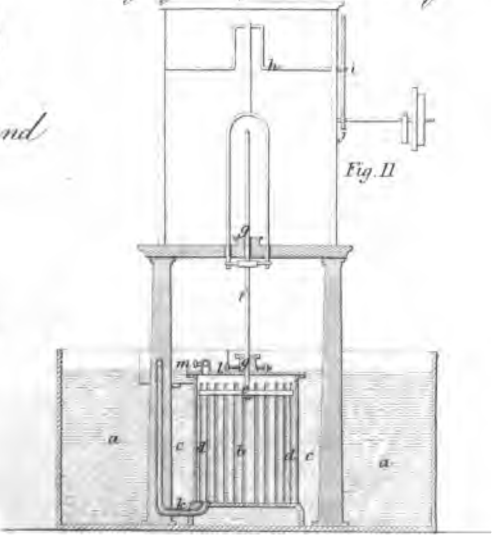


Wrigley's Paper Machinery



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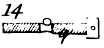

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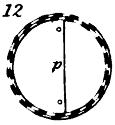

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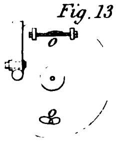
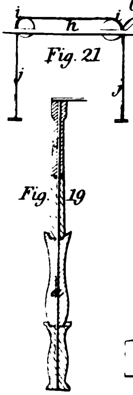
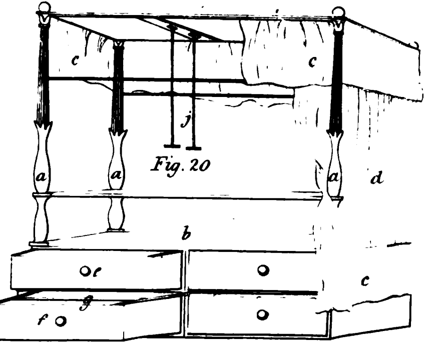


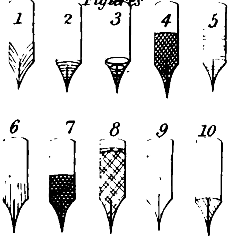
Guppy's Bedstead



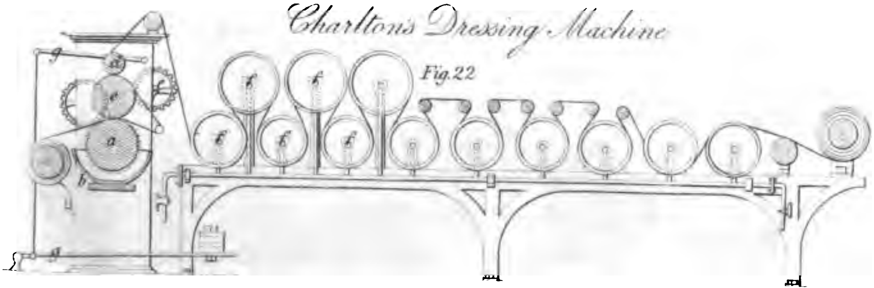


Wood's Pens

Figures



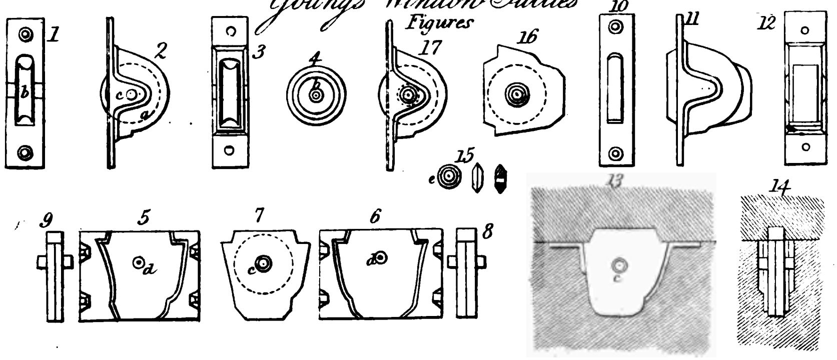
Charlton's Dressing Machine



W. Newton Delt 1st Sept. 1837. S. Wm.

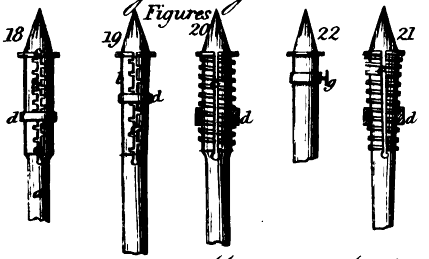
Young's Window Pullies

Figures

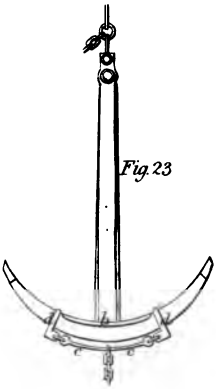


Harding's Crayon Holder

Figures



Meggitt's Anchors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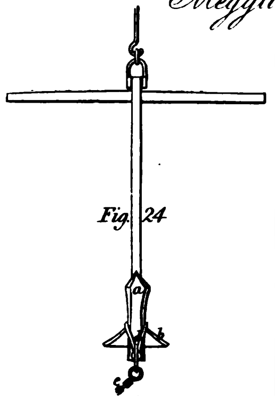
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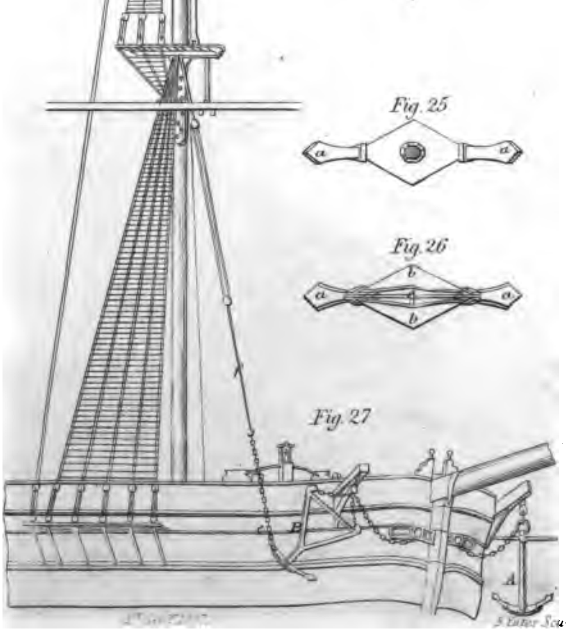
Fig. 25

Fig. 26

Fig. 27

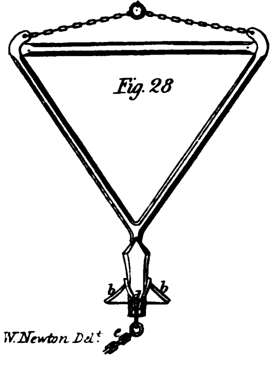
Fig. 28

W. Newton Del.t

J. Eaton Scu.